2010

A Randomized, controlled trial of mindfulness plus exposure for improving body image in women

McMahan, Amanda

A RANDOMIZED, CONTROLLED TRIAL OF MINDFULNESS PLUS EXPOSURE FOR IMPROVING BODY IMAGE IN WOMEN

by

Amanda McMahan

M.A. (Hons) International Relations- Psychology, University of St. Andrews, Scotland, 2001

M.A. (Clinical Psychology), Lakehead University, Canada, 2004

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE OF DOCTOR OF PHILOSOPHY

in Clinical Psychology

Department of Psychology
Lakehead University
December, 2009

Acknowledgements

My sincere gratitude goes to all those who have had a part in this dissertation. To Ron, thank you for your supervision, encouragement, patience, and support. Your contribution to my professional and personal development is immeasurable. I would also like to thank Drs. Mazmanian and Oinonen for their guidance during this dissertation and throughout my graduate training. Thank you to Drs. Jarry and Maundrell for your valuable feedback and insights. I am also extremely appreciative of my colleagues and friends for engaging in innumerable discussions regarding this dissertation, as well as providing welcomed and refreshing distractions. Finally, I would like to thank my family. Your part in this dissertation began well before its conception. I am so very grateful for your unconditional love and support.

Abstract

Research supports a multifaceted conception of body image incorporating attitudinal and behavioural elements. Cognitive-behavioural therapy including psychoeducation and body image exposure are two therapeutic approaches with demonstrated success in improving body image. Mindfulness practice, which has already been incorporated into a number of successful psychological treatments, has yet to be integrated into empirically tested body image treatment programs. The practice's emphasis upon awareness, nonjudgemental acceptance, description, and non-reactivity suggest it has potential to also address body image components such as internalization, evaluation, body image schema, and investment. In the present study a randomized, controlled trial investigated the utility of mindfulness combined with body image exposure (MPE). University women seeking to improve their body image engaged in mindfulness education followed by brief, daily mindfulness exercises while viewing a 3-dimensional representation of their image. The efficacy of the MPE intervention was compared to a credible, psychoeducational video program called Turning Points 2 (TP2) that addresses body image and related concerns among women. Intent-to-treat analysis revealed that both interventions were associated with significant improvement in body image and self-esteem and reductions in eating concerns and dieting behaviour with no differential efficacy. Exploratory analysis revealed the MPE intervention may be particularly beneficial in improving the body image of women with elevated baseline negative affect. Furthermore, only among those in the MPE intervention were reductions in negative affect correlated with reductions in body dissatisfaction. Results are discussed in terms

of the limitations and implications of the present findings, as well as the relative benefits of the MPE and TP2 interventions in improving body image.

Table of Contents

List of Tables

List of Figures

List of Appendices

A Randomized, Controlled Trial of Mindfulness Plus Exposure for Improving Body Image in Women

Body image is a multidimensional phenomenon encompassing perceptions, attitudes, and behaviours pertaining to one's body (Cash, Melnyk, & Hrabosky 2004; Prusinsky & Cash, 2004; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). The perceptual component refers to the accuracy of an individual's body size estimation. Body image attitude refers to the evaluative component and degree of investment an individual has towards their body (Cash, 2004). Body image behaviours can include checking of specific body areas or avoidance of situations and experiences where one's body may be evaluated (Reas, Wisenhunt, Netemeyer, & Williamson, 2002; Rosen, Srebnik, Saltzber, & Wendt, 1991).

Disturbances in body image have frequently been studied from a perceptual body size estimation perspective (Cash & Deagle, 1997). Distorting videotape (Freeman, Thomas, Solyom, Hunter, 1984), light beam image marking (Thompson & Spana, 1988), distorting mirror (Brodie & Slade, 1988), life size video projections (Probst, Vandereycken, van Coppenolle, & Pieters, 1995), and the use of authentic mirror size projections (Shafran & Fairburn, 2002) are among a few of the many technologies used to investigate body image disturbance from a perceptual accuracy stance. Initial support for this perspective rose from early investigations reporting that eating disordered women overestimated their body size (e.g., Slade & Russell, 1973). However, subsequent research has revealed that the inaccuracies of individuals with body image disturbance vary according to the instructions for, and targets of, the evaluation. University age women are accurate regarding their actual body shape when directed to estimate their

body size with a "rational view." However, when instructed to provide body size estimations based upon affective/emotional perceptions (i.e., instructed to indicate how they "felt about the size" of their body parts), women's estimations are far larger than their actual body size (Thompson & Dolce, 1989). Thus, negative body image disturbance does not appear to necessarily be a consequence of an absolute sensory deficit. Instead, body image disturbance may also be a consequence of a largely attitudinal and affective component referred to as body dissatisfaction.

Body dissatisfaction is described as the "negative subjective evaluation of one's physical body" (Stice & Shaw, 2002, p. 985). Body image satisfaction is measured in a number of ways including weight and shape satisfaction as well satisfaction with specific body parts. It can also be assessed by self-reports of discrepancies between one's actual and desired ideal body, through measures of affective distress regarding one's appearance, and observations and self-reports of behaviours associated with body dissatisfaction (Thompson & van den Berg, 2004). Research employing a variety of these methods concludes that body dissatisfaction is a relatively common phenomenon. In a recent sample of over 300 women attending university, 87% reported a desire to weigh less (Neighbors & Sobal, 2007). Over 70% of women aged 30 to 74 report feeling dissatisfied with their weight, despite being of normal weight (Allaz, Bernstein, Rouget, Archinard, & Morabia, 1998). Once thought to affect only Caucasian teenagers and women, body dissatisfaction crosses racial and cultural bounds (Grabe & Hyde, 2006), and may be present in young girls as early as 5 years of age (Dohnt & Tiggemann, 2005).

Although prevalent, body image disturbance is not inconsequential and the conditions associated with it can be significant. Prospective studies have demonstrated

negative body image as a predictor for the onset of bulimic symptoms (Johnson & Wardle, 2005; Stice & Agras, 1998) and is associated with the onset of at least partial syndrome eating disorder determined through clinical interviews (Killen, 1996). Dissatisfaction with one's body also appears to sustain disordered eating. In a meta-analytic review of both prospective and experimental studies investigating risk and maintenance factors for disordered eating, body dissatisfaction "emerged as one of the most consistent and robust maintenance factors for eating pathology" (Stice, 2002, p. 832-833).

A great deal of research has explored the negative affective responses associated with body image through exposure methods including mirror exposure (Farrell, Shafran, & Fairburn, 2004), mental imagery, and video confrontation (Tuschen-Caffier, Vogele, Bracht, & Hilbert, 2003). Such methods have revealed that when women dissatisfied with their bodies are confronted with their image, they report immediate increases in negative affect. Both clinical and community samples appear to experience these negative reactions. Tuschen-Caffier and colleagues (2003) exposed 20 female volunteers diagnosed with bulimia nervosa and 20 female non-eating disordered volunteers to their body shape using a video recording of their head, upper body, arms, waist, hips, bottom, and legs. When the 10-minute video was played back, both groups reacted with an increase in self-reported tension, anxiety, insecurity, and sadness when confronted with their body shape. Farrell, Shafran, and Fairburn (2004) reported that in a sample of 150 female students and community adults, participants with high levels of shape concern reported experiencing significantly greater negative and mixed cognitions and emotions when viewing their body shape in the mirror compared to those reporting low levels of

shape concern. These results suggest that confrontation with body image can contribute to negative affective reaction in not only patients with eating disorders but also for non-clinical community women dissatisfied with their body shape (Tuschen-Caffier et al., 2003).

A number of studies have also linked body image dissatisfaction with longer term negative psychological states such as low self-esteem, negative affect, and depression (Johnson & Wardle, 2005; Keel, Mitchell, Davis, & Crow, 2001; Noles, Cash, & Winstead, 1985; Stice & Bearman, 2001; Stice, Hayward, Cameron, Killen, & Taylor, 2000). Correlational studies support the relationship between body image and self-esteem in young adults (Wade & Cooper, 1999). Regression analyses of self-report surveys suggest that degree of body satisfaction predicts self-esteem in elementary, high school, and university aged young adults (Frost & McKelvie, 2004). Prospective research found that greater body dissatisfaction in adolescent girls predicted a decrease in self-esteem two years later (Tiggemann, 2005).

Body image dissatisfaction is also associated with negative affect and depression. Correlational research reveals that depressed adults report lower body satisfaction than their non-depressed counterparts, independent of objective ratings of attractiveness (Noles, Cash, & Winstead, 1985). Longitudinal research suggests that dissatisfaction with one's body image may even contribute to the development of depression in young women. In a 4-year, school-based, longitudinal study of young women, Stice and colleagues (2000) observed that, even after controlling for initial levels of depression, body dissatisfaction along with eating disturbances predicted the onset of major depression (Stice et al., 2000). Stice and Bearman (2001) replicated these findings,

reporting that even after statistically controlling for temperamental emotionality and lack of social support, two known risk factors for depression, body dissatisfaction and eating disturbances predicted onset of depression in adolescent girls. Further supporting this relationship, programs aimed at reducing body dissatisfaction appear to contribute to at least a temporary reduction in depressive symptoms along with eating pathology (Bearman, Stice, & Chase, 2003).

In light of its prevalence and widespread associated conditions, there has been a steady and substantial increase in body image and body satisfaction research (Pruzinsky & Cash, 2004). A great deal of this recent research has explored the attitudinal and behavioural elements associated with body image (Keery, van den Berg, & Thompson, 2004; Thompson, Heinberg, Altabe, & Tantless-Dunn, 1999). The sections that follow will elaborate upon these perspectives and respective supporting research. Specifically, the cognitive-behavioural components of internalization, evaluation, and investment (Cash, 2004) are discussed. In addition, body image checking and avoidance behaviours are reviewed. Empirical and theoretical research demonstrates that these behaviours may serve to both contribute towards and be a consequence of negative body image. Next, cognitive-behavioural therapy (CBT), an empirically validated treatment approach which addresses the multidimensional nature of body image is discussed. Specifically, CBT elements of psychoeducation and exposure methods are reviewed as they appear to be particularly effective in improving body image. Following the review, the mindfulness treatment approach is presented which considers findings from the presented perspectives that has as yet untested potential to improve body image in women. A rationale is

provided as to how key mindfulness concepts combined with the frequently used treatment method of body image exposure may potentially lead to its improvement.

Body Image

Cognitive-Behavioural Components

Internalization. Sociocultural theory posits that a great deal of body image disturbance is rooted in society's standards of beauty that place value upon unrealistically thin bodies for women (Tiggemann, 2004). The "extent to which an individual cognitively 'buys into' these unrealistic standards of attractiveness and engages in behaviours designed to produce an approximation to these ideals" is referred to as internalization (Thompson & Stice, 2001, p. 181). The contribution of internalization to negative body image is significant (Cusumano & Thompson, 1997; Thompson & Stice, 2001). Cusamano and Thompson compared the relative importance of exposure to the thin ideal, awareness of societal standards of appearance, and internalization of the thin ideal in a sample of college women. Participants completed measures pertaining to the degree of internalization and awareness of the thin-ideal, body dissatisfaction, eating disturbance and self-esteem. Participants were also asked to provide self-reports of how many hours they viewed specific magazines each month. The list included magazines independently rated as high or low in their depiction of the societal thin-ideal. Analysis revealed that mere duration of viewing magazines depicting particularly thin models was not associated with body image dissatisfaction. In contrast, awareness of societal body shape ideals was significantly correlated with body dissatisfaction. Furthermore, awareness and internalization of this thin ideal accounted for the greatest degree of variance among women's body dissatisfaction scores. Even after controlling for the

degree of awareness of societal body shape ideals, the degree to which participants internalized these society norms significantly predicted body dissatisfaction.

The significance of internalization rather than mere awareness of the thin ideal to body image in women was also supported in a meta-analysis. Cafri, Yamamiya, Brannick, and Thompson (2005) examined effect sizes from 22 studies investigating factors associated with body image in non-specialized samples (i.e., studies involving participants with eating disorders were excluded from the analysis). In most of these studies body dissatisfaction was the primary body image component measured. The researchers found that in both prospective and experimental studies, internalization of the thin-ideal had a significantly greater relationship with body image (average $r = .50$) than mere awareness of the thin-ideal (average $r = .29$).

Evaluation. The evaluative component of body image refers to the perceived discrepancy between one's actual appearance and their internalized ideal (Cash, 2005). Decades of research investigating the discrepancy between body shapes and sizes presented in the media and the actual bodies of North Americans have demonstrated that over the past 50 years, media models became leaner and thinner while people in general have become bigger with proportionately increasing body fat (e.g., Garner, Garfinkel, Schwartz, & Thompson, 1980; Wiseman, Gray, Mosimann, & Ahrens, 1992). Although recent archival analysis reveals that the trend towards increasingly thinner models may be stabilizing or even reversing, these models still remain significantly below normal weight for their age and remain the thin-ideal for women (Sypeck et al., 2006).

Research demonstrates that evaluative processes and comparisons with thin media images play a significant role in body image. In a sample of female undergraduates, self-

discrepancy ratings between their actual versus thin ideal body images served as a moderator between exposure to media images and a number of negative outcomes such as weight-related thoughts, weight-regulatory thoughts, appearance self-esteem, and total self-esteem. Furthermore, this relationship was mediated by an additional evaluative component; social comparison. In other words, women scoring high on self-discrepancies between their actual and ideal body image were also more likely to engage in comparing themselves against the media images (Bessenoff, 2006).

Dittmar, Halliwell, and Stirling (2009) studied the role of weight and body size related actual versus ideal self-discrepancy evaluations in a community sample of woman with normal body weight. Participants were exposed to advertisements featuring either thin models or no models. Confirming expectations derived from previous research reviewed above, women high in thin ideal internalization reported greater negative body-focused affect following exposure to the thin-ideal models compared to non-model advertisements. This effect was not found in women low in internalization. However, Dittmer and colleagues extended the study to investigate the role of actual-ideal self-discrepancies in the relationship between thin ideal exposure and negative body-related affect. Participants degree of actual-ideal self-discrepancy was measured using an instrument which asked participants to rate statements such as "I am overweight, but would like to be more my ideal weight" or "I am slightly fat but would like a flatter stomach." Structure equation modeling confirmed a full mediation of internalizers' negative body-focused affect following exposure to the thin-ideal through degree of weight related self-discrepancy. The researchers propose that exposure to the thin ideal activates weight-related actual-ideal judgments in those vulnerable women who have

internalized the thin ideal. These judgments then lead these women to experience negative body-related affect.

It is significant to note that the influence of thin-ideal exposure on body image is not limited to popular media exposure. It also occurs in everyday relations with peers. Krones and colleagues assigned undergraduate women to interact with women who either fit the thin-ideal or who represented the average body weight of women in the United States. Following the interaction with the confederate who fit the thin-ideal, the participants reported a significant increase in body dissatisfaction. Those who interacted with the average weight confederate did not demonstrate the same increase. Interestingly, this social comparison effect was not moderated by internalization, perceived sociocultural (e.g., from family, friends, and the media) pressure to be thin, self-esteem, or objective ratings of attractiveness. (Krones, Stice, Batres, & Orjada, 2005).

Body image schema and investment. Self-schemas refer to the cognitive structures and self-determined generalizations which organize and process self-relevant information (Cash et al., 2004). One part of this self-relevant information can be the body image schema or the "core affect-laden assumptions, or beliefs about the importance and influence of one's appearance in life, including the centrality of appearance to one's sense of self" (Cash, 2004, p. 42). An individual high in appearance schematic will process information through a very limited appearance related lens. Such an automatic information processing system restricts an individual from experiencing novel perspectives, emotions, and behaviours pertaining to their body image experiences (Stewart, 2004).

Appearance schemas appear to moderate an individual's degree of body satisfaction after exposure to the thin ideal. Hargreaves and Tiggemann (2002) presented adolescents with advertisements containing either appearance or non-appearance related commercials. Following exposure to the appearance related advertisements, all adolescent females reported increased schema activation (measured by the number of appearance related words generated during a word-stem completion tasks) as well as appearance dissatisfaction, anger, and near significantly greater weight dissatisfaction. These increases were not seen following participants viewing of non-appearance related advertisements. Further analysis revealed a moderating role of appearance schema, such that only in those high in appearance schematic did the commercial condition influence body dissatisfaction. Among those scoring low in appearance schematics, watching an appearance or non-appearance related commercial did not affect body satisfaction (Hargreaves & Tiggemann, 2002). This moderating role of appearance schematicity was not replicated in a group of 13-15 years olds. The authors suggest, however, that this lack of replication may be a consequence of the 13-15 years olds already extremely elevated level of schematicity, which would make it difficult to detect this variable as a moderator.

In addition to reflecting one's assumptions regarding the importance of appearance in life, appearance schemas also reflect one's degree of investment or belief regarding the cognitive and behavioural importance of appearance in their sense of self (Cash, 2005). Cash, Melnyk, and Hrabosky (2004) distinguish between two types of investment: motivational salience and self-evaluative salience. Motivational salience refers to self-management of appearance and attempts to look one's best. Self-evaluative

salience is the degree to which one believes their appearance dictates their self-worth. The latter form of investment appears to be particularly important to body dissatisfaction. In a sample of 95 undergraduate females enrolled in a psychology course, Ip and Jarry (2007) reported that both those reporting high scores on self-evaluative and motivational salience subscales experienced lower appearance self-esteem and higher body image importance scores after viewing thin media images. However, only women endorsing high levels of self-evaluative body image investment reported increased body image dissatisfaction and state measures of the importance of the actual-ideal discrepancy.

Body Image Behaviours

In addition to cognitive-behavioural factors of idealization, evaluation, schema and internalization, body image checking and avoidance behaviours appear to be also associated with and contribute to body image dissatisfaction (Cash, 2004). Checking behaviours include pinching, measuring, and soliciting feedback from others regarding body parts (Reas et al., 2002). Body image avoidance may include wearing baggy clothing, shunning mirrors, or evading social situations where one's body may be evaluated (Rosen et al., 1991). Both checking and avoidance are conceptualized under the larger construct of body image behaviours. They do not necessarily infer one also is dissatisfied with their body. However, these behaviours are associated with body shape concerns (Farrell et al., 2004) and may in fact contribute towards, and maintain, body dissatisfaction (Cash, 2004; Shafran, Lee, Payne, & Fairburn, 2007).

Shafran and colleagues (2007) explored the impact of body checking on body dissatisfaction in a non-clinical group of 60 women. Participants were randomly assigned to an instructional set to either engage in a high or low degree of body checking.

The high body checking group was instructed to view themselves in the mirror and inspect areas of their body through behaviours such as touching, wobbling, and examining of how much their body parts protruded. The low body checking condition required participants to look at their body, starting from the head and working down to the feet, and describe each part in a neutral manner, refraining from using either positive or negative language. Compared to those in the low body checking condition, those in the high body checking condition experienced a temporary increase in body dissatisfaction, feelings of fatness, and body-related critical thinking while viewing themselves in the mirror. Furthermore, feelings of fatness actually decreased among those in the low body checking condition. Interestingly, these changes in scores were short lived, with scores returning to baseline within 30 minutes of the intervention. In the case of body dissatisfaction, scores actually returned to significantly below baseline. Unfortunately, the authors do not speculate as to why this significant decrease might have occurred. Nevertheless, Shafran and colleagues suggest that body checking behaviour is likely to at least temporarily increase self-critical evaluation and body dissatisfaction.

Also associated with body dissatisfaction are body image avoidance behaviours. When in situations where body shape and weight cues are salient (such as going to the beach, shopping for clothing, or simply being in public), individuals dissatisfied with their bodies report frequently engaging in behaviours aimed at avoiding situations, clothing, or confrontation with their body. These avoidant behaviours are reported in body dissatisfied women with and without eating disorders (Farrell et al., 2004; Reas, Grilo, Masheb, & Wilson, 2005; Shafran, Fairburn, Robinson, & Lask, 2004). For example, in a sample of 150 healthy community and student women, 37% of those

endorsing a high degree of shape concerns reported avoiding looking in the mirror. This was significantly greater than the 6% of those reporting avoidance in the low body shape concerns (Farrell et al., 2004).

The checking and avoidance behaviours of women with negative body image are conceptualized as coping strategies employed to manage the cognitive and affect responses one has towards their body image. According to cognitive-behavioural conceptions of body image disturbance, when schema-activating events such as body image exposure occur, individuals with negative body image will engage in adjustive, self-regulatory activities in order to avoid the consequential thoughts and emotions about their body image (Cash, 2004). Engaging in body checking, however, only reinforces the cognitive biases and attention towards disliked body parts (Williamson, Muller, Reas, & Thaw, 1999). Avoidance behaviours serve to maintain the negative body image through a cycle of negative reinforcement. By avoiding their body image or body parts a woman highly invested and dissatisfied with their body is able to escape or minimize the consequential negative affect that would otherwise arise from confrontation with their body image. However, by avoiding this confrontation, the opportunity to extinguish the negative reactivity and the relationship between the activating event such as body image exposure and body dissatisfaction does not arise (Cash, 2004).

In summary, negative body image is prevalent among women and associated with psychological conditions such as negative affect, low self esteem, and disordered eating. Research reveals that body image is a multidimensional phenomenon including cognitive and behavioural components such as internalization, evaluation, body image schema, and

investment. Treatments which address these interconnected components appear warranted.

Body Image Treatments

In recent decades the most widely investigated treatment approach to addressing the above noted body image attitudinal and behavioural components has been multifaceted CBT packages. Jarry and Berardi (2004) note the following:

> Typical components of body image CBT include: psychoeducation, self-monitoring, exposure and desensitization, cognitive restructuring, behavioural interventions to reduce avoidance and checking and increase mastery and pleasure activities, problem solving and assertiveness training, and size estimation accuracy training (Cash, 1996). (p. 321)

Reviews of the CBT treatments that include these elements reveal that CBT has been largely successful at improving not only body image, but also related psychological variables of eating concerns and behaviours, emotional well-being, and self-esteem (Cash & Strachan, 2004; Jarry & Ip, 2005).

However, research also demonstrates that not all of the above listed CBT components may be necessary for body image improvement. Specifically, stand alone psychoeducational treatments have proven to be successful in improving body image as well as related psychological variables. In addition, stand-alone exposure based treatments have also demonstrated promising benefits for at least temporarily improving body image (Hilbert, Tuschen-Caffier, & Vogele, 2002; Winzelberg, Abascal, & Taylor, 2004). The following sections will elaborate upon these two treatment approaches before

describing, mindfulness, a treatment approach with as yet untested potential to improve body image.

Psychoeducation

Psychoeducation is defined as the "didactic provision of information about the nature of a disorder for the purposes of fostering attitudinal and behavioural change in the recipient (Davis & Olmstead, 1992)" (Davis, Olmstead, Rockert, Marques, & Dolhanty, 1997, pp. 25-26). Pertaining to body image, psychoeducation typically includes information regarding the sociocultural standards of beauty and the impact of these standards on body image. Body image dissatisfaction is also normalized, and the consequences of negative body image attitudes and behaviours are discussed. Participants are encouraged to self-monitor and challenge negative behaviours and cognitions. They are also taught coping strategies such as relaxation and stress management and encouraged to seek and maintain healthy social support and relationships (Winzelberg et al., 2004).

Strachan and Cash (2002) used a component control design to investigate the effectiveness of a self-administered body-image CBT program. Specifically, the researchers studied the effectiveness of psychoeducation including self-monitoring versus the same intervention plus cognitive restructuring. Women (n = 86) and men (n = 3) attending university and expressing dissatisfaction with their body image were assigned to one of two conditions. The first treatment condition consisted of only psychoeducation including self-monitoring. The psychoeducational component in the Strachan and Cash (2002) study was noted as "highly personalized" and included information regarding body image disturbance norms, causes, consequences, strategies for setting goals for

body image change and how to determine personal trajectories of body image development. Self-monitoring included identification of activating events, cognitions, emotions, and behaviours pertaining to body image related events. The second treatment condition also included psychoeducation and self-monitoring, plus cognitive techniques requiring participants to monitor and correct dysfunctional appearance assumptions and cognitive distortions regarding appearance related events. All correspondence with participants was through the mail and the treatments were entirely self-administered without any direct contact with the researchers. Results revealed that both groups demonstrated significantly reduced scores on body dissatisfaction, appearance investment, body image dysphoria, and social anxiety, and improvements in social self-esteem. Neither group demonstrated a significant reduction in body image behaviours including avoidance and checking or eating pathology. Consequentially, the authors concluded that psychoeducation with self-monitoring alone could improve body image and the cognitive-change component was not a necessary component of a CBT treatment package. This study, however, demonstrated high rates of attrition (53%), which the authors suggested may have been at least in part due to the lack of contact with the researchers.

Using a similar design, Cash and Hrabosky (2003) again evaluated the effects of a 3-week psychoeducation and self-monitoring program in university aged non-clinical women ($n = 22$) and men ($n = 3$) with elevated body image dissatisfaction. The program was individual and largely self-directed. However, unlike Strachan and Cash (2002) which involved no contact with the researchers, Cash and Hrabosky (2003) employed a design including brief weekly meetings with the research to hand in their self-monitoring

sheets and address any questions. The intention of the brief weekly meetings was to examine participant compliance rates and try to reduce attrition. From pre- to postintervention, the participants demonstrated significant improvements in body satisfaction, eating attitudes and behaviours, self-esteem and decreases in self-evaluative anxiety and body image self-evaluative investment. Specific body area satisfaction and motivational salience (i.e, self-management of appearance and attempts to look ones best) did not improve. The authors concluded that in replication of Strachan and Cash (2002), specific cognitive correction procedures were not a necessary ingredient for initiating body image improvement. Psychoeducation including self-monitoring was associated with improvements in body image. Furthermore, brief contact with the researchers appeared to dramatically improve treatment adherence.

There is also evidence that brief, group based psychoeducation is associated with improvements in body image and related psychological variables. Turning Points, a manualized psychoeducational series created to serve as a first stage treatment for eating disorders has demonstrated utility in reducing eating disorder symptomatology and body dissatisfaction in eating disordered women (Davis, McVey, Heinmann, Rockert, & Kennedy, 1999; Davis, Olmstead, & Rockert, 1990; Davis Olmstead, & Rockert, 1992; Davis et al., 1997). The aim of the Turning Points series is to normalize participants' eating behaviours by providing information regarding self-care strategies such as self-monitoring, meal planning, problem solving, and cognitive restructuring. The themes of the Turning Points series are disordered eating recovery, body and mind, making connections, body set point, normal eating and the process of change, and state of mind. The series is presented to groups in a lecture format with visual aids and videos. The

series is accompanied with facilitator manuals and workbooks for the participants that contain information and home exercises pertaining to each section.

Unlike CBT and highly personalized individual treatment approaches, the psychoeducational treatment program developed by Davis and colleagues is brief, puts significantly less emphasis on the therapeutic alliance, and is not tailored to the individual. General discussion among the group is encouraged. However, self-disclosure is specifically discouraged (Davis et al., 1999).

Evaluation of the Turning Points series in individuals in treatment for bulimia nervosa revealed that this psychoeducational approach yields improvements such that scores on not only eating disordered symptoms but also body image dissatisfaction become more similar to those without eating disorders. Adding a group psychotherapeutic process element to the psychoeducational package did not demonstrate appreciable benefits in eating disorder symptom reduction or body image (Davis et al., 1997). Furthermore, adding on a 16-week individualized CBT program following the psychoeducational series produced no additional benefits to body image. Compared to administration of the Turning Points alone, adding CBT did not provide any additional gains in improving self-esteem and social adjustment or reductions in depressive symptoms or general psychological distress (Davis et al., 1999). In summary, psychoeduation alone, without additional psychotherapeutic group process component or additional individualized CBT elements can produce significant improvements in body image in women presenting with disordered eating.

More recently, research has revealed the benefits of psychoeducation in improving body image in a non-clinical population. *Turning Points for Teens* (TP2;

Davis et al., 2004) is a psychoeducational video program featuring six women attending university and a moderator discussing their knowledge, experiences, and insights regarding body image, eating behaviours, mood regulation, physical activity, and relationships. The video segments include elements of normalization of body dissatisfaction, awareness of sociocultural standards of beauty, the behavioural and affective maintenance factors and consequences of negative body image, healthy eating, relaxation, physical activity, and relationship management. Each segment is approximately 15 minutes in length and accompanied by a manual chapter which reviews and elaborates upon the content of the videos.

Recent research has reported that the TP2 program implemented in a group format in high school health classes is associated with a significant decrease in restrained eating and body shape concerns. In a study conducted by Bone (2006), three female Psychology graduate students led group presentations of the TP2 program. Volunteer participants were 53 female students who viewed and discussed all 14 segments of the TP2 program during regular class time on consecutive school days over 2 weeks. Students reported statistically significant reductions on the Eating Disorder Examination Questionnaire (EDE-Q) Restraint and Shape Concerns subscales with small-to-medium effect sizes (Cohen's d = .37 and .38 and power = .75 and .79, respectively). The importance of this finding is underscored by the fact the participants were not specifically selected and recruited for possessing extreme scores on restraint or shape concerns at baseline, thereby negating regression toward the mean as a competing hypothesis for the attribution of cause and effect. Furthermore, the intervention effect was specific to eating behaviour and body image as students did not report any significant changes on the Positive and

Negative Affect Schedule Positive and Negative Affect subscales, Beck Depression Inventory, or the Rosenberg Self-Esteem Scale. Thus, TP2 appears to have a specific positive effect on the body image of healthy young women who, as a group, are normatively typical to begin with.

Exposure

Although more commonly used in perceptually-oriented body image CBT treatments, body image exposure also appears helpful in addressing cognitive and affective aspects of body image (Hilbert, & Tuschen-Caffier, 2004). Body image exposure may include mirror exposure (Hilbert et al., 2002), video confrontation (Tuschen-Caffier et al., 2003), or virtual reality exposure (Riva, 1998). Such techniques provide visual feedback of one's body image, allowing the person the experiential opportunity to correct distorted body image attitudes (Hilbert et al., 2003). Traditionally, these exposure methods have been used in conjunction with cognitive restructuring techniques (Cash & Strachan, 2004). However, treatment component research suggests that such cognitive restructuring may not be necessary in order to achieve body image improvement. In a sample of women with Binge Eating Disorder (BED), Hilbert and Tuschen-Caffier (2004) conducted a component analysis comparing the effectiveness of a CBT program using body image exposure against a CBT program employing cognitive restructuring of body-related thoughts. Participants were 28 females with BED assigned to either CBT-Exposure (CBT-E) or CBT-Cognitive (CBT-C). The core treatment for all participants involved 19 group therapy sessions which discussed eating, body image, and stress reduction. The two treatments only differed in four of the sessions. During these four unique sessions, the CBT-E group participated in in-vivo mirror exposure, exposure

to avoided body-related situations, and body exposure homework assignments. Cognitive restructuring was not discussed in the CBT-E group. During the four unique sessions, those in the CBT-C condition were only provided with education and given homework on cognitive restructuring and self-monitoring. No exposure methods were introduced. Analysis revealed that the CBT-E intervention proved just as effective as the CBT-C program in reducing body image dissatisfaction, eating concerns and restraint, and depressive symptoms. These results suggest that body image exposure alone can achieve the same body image benefits as cognitive restructuring. However, both the exposure and the cognitive restructuring treatments in the study also included extensive psychoeducation, motivation for change techniques, and lengthy discussions with clinicians regarding the cognitive and behavioural components of binge eating (Hilbert & Tuschen-Caffier, 2004). Consequently, the utility of body image exposure without these CBT components could not be determined.

However, additional research investigating the utility of exposure-based interventions void of additional CBT elements have reported success in improving body image. Rather than employing traditional CBT elements of cognitive restructuring, these studies have employed researcher guidance and immediate feedback encouraging the participants to view themselves in a less critical and judgmental manner. Results of this approach are promising. For example, Hilbert and colleagues (2002) investigated the effects of a clinical psychologist guided mirror confrontation in a sample of 30 females diagnosed with BED and 30 female non-eating disordered controls. Participants stood at 2 ft distance in front of the mirror (with the wings of the mirror opened to 45 degrees) while dressed in a white leotard. While viewing themselves in the mirror, participants

were asked to describe themselves as precisely as possible. If the participants described any body parts in either positive or negative terms they were immediately reminded by the investigator to use more neutral descriptors. Following each exposure exercise, participants were guided through brief relaxation and provided with an opportunity to discuss their feelings about the exposure. Pre- and postintervention participant mood state was measured as a mean of their ratings of present sadness, tension, anxiety, insecurity, and disgust. Appearance self-esteem was evaluated using a state self-esteem scale and a thoughts checklist was employed to detect changes in negative body and eating related thoughts. After only two guided exposure sessions, both the BED and healthy controls improved in appearance self-esteem and mood state (Hilbert et al., 2002). The authors conclude that this form of investigator guided mirror exposure followed by relaxation and an opportunity to speak about ones appearance reduced negative mood state and state appearance self-esteem. However, this conclusion cannot be confirmed as Hilbert and colleagues did not include a control condition by which to compare outcomes.

Delinsky and Wilson (2006) have also reported success in improving body image through mirror exposure coupled with guidance to view oneself in a more neutral manner. This technique is referred to as "mindful mirror exposure." In their study, women were specifically selected for possessing extreme weight and shape concerns based upon a composite score of six items related to body image. Four of the items were from the Eating Disorders Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) that ask participants to rate their dissatisfaction with weight, dissatisfaction with their shape, and importance of weight and shape. Two additional items from the EDE interview assessed

participants' acceptance of their body shape and weight. During the intervention, participants were instructed by therapists to describe their bodies in a mindful neutral manner while viewing their image in a full-length mirror. Participants were given homework assignments to self-monitor and reduce body image related checking and avoidance behaviours. The homework was reviewed with a therapist during the next session. This guided mirror exposure and self-monitoring condition was compared to a three-session non-directive treatment control condition. The control condition was largely psychoeducational and included daily journaling and self-monitoring of thoughts and feelings by participants regarding their body image and Socratic questioning during the individual sessions with a therapist.

Following three sessions of the therapist guided mindful mirror exposure and behavioural homework, participants' shape and weight concerns, body image checking and avoidance, and depressive symptoms significantly decreased and self-esteem significantly improved compared to participants in the non-directive treatment condition. Specific body part dissatisfaction and dieting improved, but not to a greater extent than in the non-directive treatment condition. The authors suggest that the guided mindful mirror exposure and the behavioural homework were likely the key components to explain its efficacy. The authors questioned if the instructions to use more mindful, neutral description was necessary for the observed improvements (Delinsky & Wilson, 2006). However, one is also left to question if either the in vivo instruction or the behavioural homework were necessary.

In summary, CBT is associated with improvements in body image, eating concerns and behaviours, emotional well-being, and self-esteem (Cash & Strachan, 2004;

Jarry & Ip, 2005). However, there is evidence that an entire CBT treatment package may not be required in order to affect change. For example, individual and group psychoeducation without group process or additional individualized CBT elements has demonstrated utility in improving body image and related symptoms (Bone, 2006; Davis et al., 1999). In addition, there is also increasing evidence that body image exposure without CBT cognitive restructuring techniques can contribute to improved body image, eating concerns and restraint, and depressive symptoms. Instead of cognitive restructuring, it appears that instruction to view one's image in a neutral, mindful manner may also contribute to improved body image. However, studies investigating this mindful approach have employed either in vivo therapist instruction and correction or CBT elements of behavioural homework. The utility of an exposure based program which incorporates these recent finding of the potential benefits of a mindful exposure approach, but without the need for individual correction or feedback or behavioural homework has yet to be tested. Furthermore, studies investigating mindful mirror exposure have included participants with disordered eating or those with extreme weight and shape concerns. The utility of such an approach with non-disordered eating women unselected for possessing extreme weight and shape concerns has yet to be tested.

Mindfulness Practice

The literature reviewed above provides a basis for the speculation that mindfulness practice may serve to improve body image and possibly the related facets (Stice, 2002; Stice et al., 2000) of disordered eating, self-esteem, and affect. Mindfulness is described as a process whereby one experiences the present moment purposefully, flexibly, and with full awareness (Bishop, 2002). It is a "moment-to-moment perception

of phenomena and the allowance of it to register with full awareness without the influence of cognitive shortcuts or distortions, desires, or expectations" (Stewart, 2004, p. 784). Its origin rests in Buddhist tradition of "bare attention." However, Western adaptations of mindfulness have infiltrated modern clinical psychology under headings such as acceptance and mindfulness-based cognitive-behavioural therapies, dialectic behaviour therapy, and mindfulness-based stress reduction therapy, to name a few (Roemer & Orsillo, 2003). Such mindfulness-based treatment modalities have shown to be successful in alleviating physical, behavioural, and psychological symptoms in individuals with chronic pain (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth, & Burney, 1985), generalized anxiety and panic disorders (Kabat-Zinn, Massion, Kristeller, & Peterson, 1992), psoriasis (Kabat-Zinn et al., 1998), fibromyalgia (Kaplan, Goldenberg, & Galvin-Nadeau, 1993), cancer (Speca, Carlson, Goodey, & Angen, 2000), and binge eating disorder (Kristeller & Hallet, 1999).

Mindfulness meditation training has also demonstrated utility in reducing negative affect and depression relapse rates. In a randomized clinical trial of recovered, recurrently depressed patients followed over five years, Teasdale and colleagues (2000) reported that patients with three or more previous episodes of depression demonstrated a significantly reduced risk of relapse/recurrence following participation in a mindfulness-based cognitive therapy (MBCT) group compared to those who received only treatment as usual (Teasdale et al., 2000). Michalak and colleagues reported that following an 8-week MBCT group, improvements in mindfulness scores were predictive of reduced relapse risk in formerly depressed patients, even after controlling for previous number of depressive episodes (Michalak, Heidenreich, Meibert, & Schulte, 2008).

Ramel, Goldin, Carmona, and McQuaid (2004) investigated the mechanisms behind the effects of mindfulness meditation on affective symptoms, dysfunctional attitudes, and ruminative tendencies in individuals with a history of a mood disorder. Following an 8-week mindfulness-based stress reduction (MBSR) course, participants reported a reduction in affective and cognitive symptoms. However, currently depressed participants demonstrated an even greater reduction in negative affect following the MBSR than those not presenting with active depressive symptoms. Participation in the MBSR course was also associated with significant reductions in ruminative tendencies, which accounted for the reductions in maladaptive attitudes and affective symptoms. The authors suggest that mindfulness meditation may contribute to decreased negative affect and depressive relapse rates by encouraging a state of mind wherein the intensity of ruminative thoughts and feelings is reduced and fails to contribute to negative affect.

The researchers and practitioners of mindfulness in these Western therapeutic applications differ in their emphasis upon various facets of mindfulness. However, exploratory and confirmatory factor analytic methods conducted by Baer and colleagues (2006) using the combined responses of undergraduate students on five mindfulness questionnaires revealed four key facets encompassed in a broader mindfulness construct. The constructs are describing, acting with awareness, nonjudegment, and nonreaction (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Given the above cited theory and empirical work regarding body image, its facets, and effective treatments, there is evidence that these key mindfulness components may prove beneficial for individuals with body image disturbance.

Awareness

Awareness is described as conscious awareness of one's internal and external environment of present-moment experience rather than past or future events (Roemer & Orsillo, 2003). In mindfulness, awareness is very different from attention. The process of attention facilitates one's focus upon a limited range of experiences, while mindfulness encourages openness to new experience. Rather than being constrained by schemas which occupy the mind and provide only one very limited perspective, a mindful individual is open to a range of experiences and multiple perspectives. Such a sense of "wakefulness" allows for openness to new information, the creation of new categories for structuring information, and enhanced awareness of new perspectives (Langer & Moldoveanu, 2000; Stewart, 2004).

Increasing mindful awareness could prove beneficial for women with body image disturbance. Attention towards negative shape and weight stimuli has been implicated in increasing body dissatisfaction. Smith and Reiger (2006) administered a computerized attentional probe task to university attending women who were specifically selected for the study because they did not present with extremes in body dissatisfaction. The task required participants to view either negative shape or weight-related words, neutral words, or negatively valenced emotion words on a computer screen. Only those who were required to attend to the shape or weight stimuli demonstrated increases in general body dissatisfaction regarding shape and weight over the course of the task. The authors suggest that the results support the hypothesis that attentional bias toward shape and weight related information plays a causal role in body dissatisfaction (Smith & Rieger, 2006). It thus follows that adoption of a mindfulness practice could reduce body

dissatisfaction by expanding awareness beyond shape and weight related material. Such an expansion allows the individual to begin to generate alternative perspectives and possibly adopt an accepting perception of themselves (Stewart, 2004).

Nonjudgement

The second component of mindfulness is the nonjudgmental way in which present-moment awareness is experienced. Nonjudgmental engagement facilitates an attitude of acceptance and compassion toward one's experience. When mindful, one is able to see oneself as worthy and deserving of compassion, regardless of whether they are perfect or meet the ideal. Their sense of self is not invested in their approximation to perfection. Instead, they are encouraged to free themselves of the rules set up by themselves and instead engage in a state of acceptance as is, rather than judging or labeling (Stewart, 2004).

Acceptance can be understood as allowing a thought or feeling into one's awareness without an automatic response to try to change or fix the experience (Segal, Williams, & Teasdale, 2002). When practising nonjudgement in mindfulness, one takes a position of "non-striving" or acceptance. Individuals are encouraged to perceive their experiences with an openness and curiosity. Although many descriptions of mindfulness reflect the components of awareness and nonjudgmental acceptance, the distinction between the two is generally not emphasized. It is often assumed that increased present-moment awareness will necessarily occur with an attitude of enhanced acceptance and, conversely, that enhancing one's stance of nonjudgmental acceptance will necessarily lead to increased awareness. However, the degree to which changes in either component tend to impact changes in the other is an open question. High levels of awareness need

not be accompanied by high levels of acceptance. For example, research demonstrates that panic disorder is associated with increased awareness of internal physiological cues (e.g., Ehlers & Breuer, 1996). However, this awareness is not accepted nonjudgmentally by the panic patient. Enhancing nonjudgmental awareness could potentially improve body image by decreasing appearance comparison behaviours and perfectionistic tendencies associated with body image. Mindfulness encourages an acceptance of one's body as is, rather than in relation to an ideal or social comparative. For women who engage in this type of comparison regarding their weight and shape, reducing this style of self-evaluative and judgmental thinking may serve to improve their body image.

Describing

Mindfulness practice encourages one to distance oneself from ruminative thoughts, and to view those thoughts not as fact, but as mental events that are *just* thoughts (Bishop, 2002). Safran and Segal (1990) describe a processing of "decentering" as changing the nature of one's experience by having the capacity to observe oneself and step out of one's immediate experience. This decentering technique contrasts with traditional cognitive and behaviour therapy in that rather than changing the content of one's thoughts and beliefs, one is taught to change their relationship with one's thoughts so that one's cognitions become objects of awareness rather than reflections of reality (Bishop, 2002). When engaged in mindfulness practice, individuals are encouraged to allow troubling emotions and cognitions into conscious awareness. However, instead of attempting to engage in a Socratic process of evaluation of evidence and challenging the thoughts, they are instructed to welcome the thoughts with a spirit of curiosity and perceive them mere descriptions of their experience. Unconditionally allowing cognitive

and affective experiences into consciousness also allows them to be experienced in isolation from the chain of thoughts experienced in a ruminative and judgmental process (Segal et al., 2002).

The Delinsky and Wilson (2006) study described above is an example of the potential utility of such a descriptive approach in young women's body image experience in front of a mirror. The women in the study were not permitted to judge or use subjective adjectives to describe their body. If the women did use critical language during the exercise, a therapist interjected and reminded the participants of the instructions. Following the three intervention sessions and the behavioural homework, the women in the descriptive mirror exposure condition scored significantly lower on a number of body weight and shape measures as well as depression scores and dieting behaviours compared to women involved in the non-directive treatment group. This study design does not permit conclusions on the relative importance of the descriptive approach to experiencing one's body compared to other components of the behavioural homework or the mirror exposure. However, it does suggest that this style of descriptive mindful processing may be helpful in improving body image.

Nonreactivity

Nonreactivity refers to the "tendency to allow thoughts and feelings to come and go, without getting caught up in or carried away by them" (Baer et al., 2008, p. 330). Mindfulness invites participants to take neutral observer perspective. Instead of reacting to events or perceptions (e.g., thoughts, negative affect, and physical sensations) participants are invited to simply observe the events in a neutral manner; neither positive nor negative (Stewart, 2004). Such neutral approach can contribute to decreased

emotional reactivity (Bishop 2002) and can facilitate desensitization and a reduction in impulsive reactions to the experience (Baer, 2003; Breslin, Zack, & McMain, 2002; Hayes & Wilson, 2003).

Practising nonreactivity could benefit individuals prone to respond to body image distress. When engaged in mindfulness, participants are encouraged to view their bodies more objectively and from multiple perspectives. This approach allows the emotions to arise, but with less intensity and therefore no need for a behavioural responses (e.g., avoidance or checking) to alleviate the distress (Stewart, 2004). Furthermore, by confronting the thought or emotion, an individual with a mindful perspective can foster a sense of mastery rather than the sense of helplessness that occurs with ignoring or avoiding the event (Segal et al. 2002).

It is also noteworthy that in mindfulness practice, how to problem-solve the distress is ignored (Segal et al., 2002). Whether an internal or external event can be controlled is irrelevant. When mindful, one does not react with intention to change their environment or experience. In relation to body image, engaging in this type of non-problem solving perspective is likely to be beneficial. Movement towards one's ideal (i.e., becoming thinner) may well be possible. However, for many women this movement from actual towards their ideal is not adaptive and may serve to increase unhealthy eating behaviours. As such, an approach which does not encourage one to "fix" the perceived source of their distress could prove beneficial for women dissatisfied with their bodies.

Finally, in encouraging nonreactivity, mindfulness practice encourages openness to the intrinsic qualities of an activity. Such openness allows for an increase of pleasure experienced during an event or emotion and a decrease in negative mood associated with

failing to achieve the extrinsic outcome (Borkovec, 2002). The extrinsic outcome in the instance of body image concerns is achievement of the ideal. As such, one may be able to enjoy the experience of the moment (e.g., lying on the beach or clothing shopping) rather than fixating on the failure to achieve their ideal body size or shape.

The Present Study

To summarize, body image is multifaceted phenomena which includes attitudinal and behavioural components. Cognitive-behavioural components of internalization, evaluation, and investment (Cash, 2004) and behavioural checking and avoidance are all well researched components of body image disturbance (Farrell et al., 2004; Reas et al., 2005; Shafran, Fairburn, Robinson, & Lask, 2004). Empirical literature reviews reveal that CBT is largely efficacious at improving not only body image, but also related psychological variables of eating concerns and behaviours, emotional well-being, and self-esteem (Cash & Strachan, 2004; Jarry & Ip, 2005). Component analysis of CBT provides evidence to suggest that some stand alone elements of CBT like psychoeducation are equally beneficial to more multi-component treatment packages (Cash & Hrabosky, 2003; Cash & Strachan, 2002; Davis et al., 1999; Davis et al., 1990; Davis et al., 1997). In addition, body image exposure coupled with instruction to describe ones image in a neutral, nonjudgemental way appears to contribute to improved body image. However, studies investigating this exposure approach have employed methodology requiring either invivo clinician feedback or the addition of other CBT elements like behavioural homework (Delinsky &Wilson, 2006; Hilbert et al., 2002). To date, the utility of a more mindful based approach to body image exposure in improving body image and related psychological variables in unknown.

To begin to address this unknown, the first objective of the present study was to investigate the utility of a mindfulness-based intervention that was combined with body image exposure (mindfulness plus exposure; MPE) to improve body image in women. Given the empirical and theoretical review above, it was anticipated that participation in the MPE condition would be associated with improvements in body image. To explore this hypothesis, this work involved a treatment design utilizing a comparison condition of psychoeducation, to which the potential differential efficacy of MPE could be compared.

As reviewed, psychoeducation alone has demonstrated utility in improving body image in women. In this study, TP2 was selected as the appropriate psycheducational comparative treatment control. The reason for utilizing TP2 in the present comparative study lies in the fact that the MPE and TP2 interventions are very similar in several ways. First, both programs focus on improving the body image of healthy young women. Previous research reveals that TP2 appears to have a specific positive effect on the body image of young women who, as a group, are normatively typical to begin with (Bone, 2006). In the present study, participants were recruited from a general university population unselected for possessing extreme body image dissatisfaction. Second, the time requirements for the delivery of the MPE and TP2 conditions can be calibrated to be very similar. Both interventions required approximately 25 minutes per day over 14 days. Finally, both programs used similar modes of delivery. MPE and TP2 were presented individually and with minimal involvement of the researcher or a therapist. The delivery of both interventions relied upon the use of internet and multi-media technologies.

The second objective of the present study was to explore if practising mindfulness was associated with improvements in participants' mindfulness skills. Specifically, it investigated if participation in the MPE condition was associated with improvements in state and trait measures of mindfulness skill. To this aim, participants in the present study completed measures of mindfulness traits of awareness and acceptance before and after the interventions. Given those participants in the TP2 intervention were not practising daily mindfulness, it was expected that only the MPE group would report improvements. To measure changes in participant's ability to achieve mindfulness states, decentering and curiosity were measured throughout the MPE intervention. It was anticipated MPE participants would improve in decentering and curiousity over the course of their intervention.

The third objective of the present study aimed to explore the potential relationship between mindfulness and body image. To this aim, changes in mindfulness acceptance, awareness, decentering, and curiosity were assessed for correlations with change in body image over the course of the interventions. Finally, the fourth objective of the present study was to explore the role of negative affect in the improvements anticipated from the MPE condition. Research has demonstrated that mindfulness based techniques appear to be particularly effective in reducing depressive symptoms among individuals reporting elevated negative affect (Ramel et al., 2004). Exploratory analysis investigated whether those high in negative affect also benefit from MPE to a greater extent in body image compared to their low negative-affect counterparts.

Method

Materials

Concerns for Shape and Weight Scale (CSAW; Davis, 1993; see Appendix A). The CSAW is a 40-item scale consisting of two subscales measuring the attitudinal and affective sentiments that individuals have towards their body weight and shape. The Attitudinal subscale (CSAW-Attitude) consists of 22 items measuring the value respondent's place on their body weight and shape in their self-evaluation. The Affective subscale (CSAW-Affective) has 18 items, which indicates respondents' negative affect towards their body. Items are rated on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items 3, 6, 7, 11, 15, 17, 19, 21, 24, 28, 30, 32, 34, 35, 38, 39, and 40 are reverse scored. Higher total scores indicate greater dissatisfaction. Test-retest reliabilities for the Affective and Attitudinal subscales over 2 weeks are high; $r = .94$ and $r = .85$, respectively. The two subscales are highly intercorrelated ($r = .73$), and both subscales have high internal consistency. Cronbach's alphas for the Affective subscale is .94, and even higher in the Attitudinal subscale at .98.

The Eating Disorder Inventory - 2- Body Dissatisfaction Scale. (EDI-2-BD; Garner, 1991; see Appendix B). This 9-item scale requires respondents to rate their satisfaction with different body parts on a six-point scale from *always* to *never*. Items 1, 2, 6, and 8 are reverse scored. The sum of all items equals the total score, with higher scores indicating higher body dissatisfaction. Reports indicate internal consistency alpha coefficients for undergraduate women is .93 (Spillane, Boerner, Anderson, & Smith, 2004), and a 1-year test-retest reliability coefficient among 282 nonpatients is greater than .70 (Crowther, Lilly, Crawford, & Shepard, 1992).

Body Checking Questionnaire (BCQ; Reas et al., 2002; see Appendix C). The BCQ measures overall appearance, specific body parts, and idiosyncratic checking behaviours. Participants respond to 23-items with a format from 1 (*never*) to 5 (*very often*) to indicate how often they presently engage in the checking behaviours. Higher scores indicate more frequent checking. The measure has good 2-week test-retest reliability (r = .94) and excellent concurrent validity with other measures of negative body image (Reas et al., 2002).

Body Image Avoidance Questionnaire (BIAQ; Rosen et al.,1991; see Appendix D). The BIAQ is a 19-item self-report measure of avoidant behaviours associated with concerns regarding physical appearance. The measure has adequate internal consistency (α = .89), good 2-week test-retest reliability (r = .87), and is sensitive to body image disturbance treatment changes (Rosen et al., 1991).

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994; see Appendix E). This self-report questionnaire contains 36-items which assess attitudes and frequencies of behaviours associated with eating disorders. Participants respond to items on a scale from 0 (*not at all*) to 7 (*markedly*). The EDE-Q renders a global score of eating disorder pathology and four subscales evaluating dietary Restraint (EDE-Q-R), Eating Concerns (EDE-Q-EC), Shape Concerns (EDE-Q-SC), and Weight Concerns (EDE-Q-WC; Fairburn & Beglin, 1994). Concurrent and criterion validity for the global scale and subscales on the instrument have been confirmed (Mond, Hay, Rodgers, Owen, & Beumont, 2004). Internal consistency of the EDE-Q shows Cronbach's alpha range from .78 to .93. Two-week test-retest reliability coefficients range from .81 to .94 (Carter, Stewart, & Fairburn, 2001).

Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1989; see Appendix F). This 10-item measure of global self-esteem requires respondents to determine whether statements apply to them on a 4-point scale, from 1 (*strongly agree)* to 4 (*strongly disagree)*. Items 1, 3, 4, 7, and 10 were reversed scored. Higher total scores indicate higher self-esteem. Silber and Tippett (1965) reported a 2-week test-retest reliability coefficient of .85.

Kessler 6-Item Psychological Distress Scale (K6; Kessler et al., 2002; see Appendix G). The K6 is a 6-item screening questionnaire for psychological distress. Respondents answer six questions indicating the frequency of symptoms from 0 (*none of the time*) to 1 (*all of the time*). Higher scores indicate greater psychological distress. The measure was validated in a sample of 155 adults who screened positive for mental health problems during a brief telephone interview. The selected adults completed a number of psychological screening scales followed by an administration of the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1996) by clinician interviewers who were blind to the results of the respondents screening instrument scores. This process is termed the clinical reappraisal method. The K6 demonstrates high internal consistency with a Cronbach's alpha of .89. In addition to discriminating between community cases and non-cases of psychological disorders, the brief measure is demonstrated as an effective screener for detecting serious mental illness from non-cases (Kessler et al., 2003). In the 2002 Canadian Community Health Survey including a sample of over 36,000 people ages 15 years and older the K6 demonstrated excellent agreement compared to the Composite International Diagnostic Interview. The

researchers deem the K6 to be an excellent screening instrument for current depression (Cairney, Veldhuizen, Wade, Kurdyak, & Streiner, 2007).

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; see Appendix H). This 20-item scale contains two dimensions of mood, Negative Affect (PANAS-NA) and Positive Affect (PANAS-PA). In the present study respondents rated the items with reference to their emotions experienced "during the past few weeks." The 5-point response scale ranges from *very slightly or not at all* to *extremely.* Cronbach's alphas for the PANAS-PA and PANAS-NA subscales range from .86 to .90 and .84 to .87, respectively. The PANAS has excellent convergent and discriminant validity with longer measures of mood. It has also been deemed reliable at a 2-month test-retest interval (Watson et al., 1988).

Dutch Restrained Eating Scale (DRES; van Strien, Frijters, van Staveren, Defares, & Deurenberg, 1986; see Appendix I). The DRES is a 10-item measure of dieting behaviour. Items are rated on a 5-point scale from 1 (*never*) to 5 (*always*). Higher summed scores indicate greater dieting behaviour. The DRES has been shown to have good internal consistency and a test-retest reliability above .82 for a period of 2 weeks (Allison, Kalinsky, & Gorman, 1992).

Philadelphia Mindfulness Scale (PHLMS; Cardaciotto, Herbert, Forman, Moitra, Farrow, 2008; see Appendix J). The PHLMS is a 20-item scale measuring trait mindfulness. Participants are instructed to indicate how often, in the past week, they have experienced various mindfulness events. The measure yields two factor analytically derived scales related to mindfulness; awareness (PHLMS-Awareness) and acceptance (PHLMS- Acceptance). The authors of the measure define awareness as the "the

continuous monitoring of ongoing internal and external stimuli," while acceptance is described as "the nonjudgemental stance towards one's experience" (Cardaciotto et al., 2008, p.208). Responses range from 1 (*Never*) to 5 (*Very Often*). All items on the Acceptance subscale are reverse scored. Higher scores on the subscales indicate a greater degree of the trait. Non-clinical, clinical, eating disordered, and student counseling samples were included in the psychometric validation of this instrument. The PHLMS demonstrates good internal consistency and adequate discriminant validity between clinical and non-clinical groups. Clinical sample scores of awareness and acceptance were significantly lower than those reported in the student samples. Inpatients with eating disorders also report significantly lower levels of acceptance than the student normative samples (Cardaciotto et al., 2008).

Toronto Mindfulness Scale (TMS; Lau et al., 2006; see Appendix K). The TMS is a 13-item measure of mindfulness state administered immediately following a mindfulness meditation session. Confirmatory factor analysis verifies the scale's two-factor structure of Curiosity and Decentering. Lau and colleagues (2006) define curiosity as the "awareness of present moment experience with a quality of curiosity," whereas Decentering is described as "awareness of one's experience with some distance and disidentification rather then being carried away by one's thoughts and feelings" (Lau et al., 2006, p.1452). Demonstrating its sensitivity to change, TMS scores from before and after an 8-week mindfulness-based stress reduction program revealed significant improvements in both Curiosity and Decentering subscales following treatment. Incremental changes in TMS scores during treatment (i.e., throughout various points of treatment) have not been reported. The authors of the instrument have compared TMS

subscale scores to other measures of potentially related constructs. Curiosity and Decentering subscales are significantly correlated with measures of Absorption, Awareness of Surroundings, Reflective Self-Awareness, and Psychological Mindedness. The Decentering subscale is positively correlated with Openness with Experience and negatively correlated with Cognitive Failures. The Curiosity subscale is correlated with Internal State of Awareness and Self-Consciousness. Neither of the subscales correlate with Dissociation, Ruminative Self-Awareness, or Social Desirability. Consequently, Lau and colleagues (2006) have concluded that the TMS is a measures of heightened focus of attention to internal states (rather than one's external environment) and reflective, introspective self-awareness rather than ruminative self-focused attention or self-consciousness.

Apparatus

The following apparatus were used to construct and view the 3D images of the volunteers participating in the MPE condition.

CNC milled aluminum mount. This is a camera rig mount for digital stereo photography. The mount was set to position the centre of the two cameras lenses 86 centimeters apart from one another.

Digital Rebel XT. Two digital Cannon cameras were employed that feature 8.0 Megapixel Complementary Metal Oxide Semiconductor sensors noted for its clarity, tonal range, and speed.

Nero Photoshow Deluxe. This software allows for 3D images to be paired with the mindfulness audio recordings and played simultaneously as a slideshow on a DVD.

StereoPhoto Maker (Suto, 2006). This software program allows for left-right photographs to be automatically processed and aligned to create 3D analglyph images.

Cardboard anaglyph 3D glasses. Manufactured and sold by Berezin Stereo Photography Products, the red-blue are chromatically tuned to phosphors in computer screens to minimize ghost images and visual distortions. When used with the differently filtered coloured images of the participants created with the StereoPhoto Maker software, a stereoscopic image is achieved for the viewer. The red lens is located over the left eye and allows only the red part of the participant's anaglyph image through to that eye. The blue lens over the right eye allows only the blue the participant's image through to that eye. The two images are then perceptually fused by the viewer and a 3D image is achieved. The frames fit over most regular frames with corrective lenses.

SurveyMonkey. This is an online software program for designing, collecting, and analyzing surveys. Links to the online survey can be sent via email and results downloaded into an Excel file for further analysis.

Procedure

Participant screening and recruitment. Female participants age 17 years and above were recruited through Introduction to Psychology class announcements, poster advertisements on campus, inter-university emails, and Lakehead University information web postings inviting those interested to complete an online questionnaire. Participants were recruited in three waves. During these waves, the online questionnaire was available from February 2, 2007 to April 27, 2007; May 4 to July 30, 2007; and September 18 to November 19, 2007. These waves coincided with the University academic term schedule. In appreciation for completing the online baseline

questionnaires, participants received one Introduction to Psychology bonus point if they were enrolled in the class, and everyone's name was entered into a $50 prize draw.

Those participants who completed the online questionnaire and who indicated they would like to participate in a body image improvement study were emailed an invitation to further participate (Appendix L). Upon receipt of their emailed reply indicating continued expressed interest, participants names were randomly allocated to either the MPE or TP2 condition and emailed a consent form, brief overview of their respective program, and an agreed upon introduction meeting date and time. Those who participated in the program received an additional Introduction to Psychology bonus point if they were enrolled in the class and all were entered into a $50 prize draw.

Intervention introduction session. Upon arrival at the laboratory for the introduction meeting, all participants signed a hard copy of the previously sent informed consent form for their respective conditions (Appendices M and N). Study procedures for their conditions were reviewed and participants provided confidence and credibility ratings for their respective interventions.

MPE. During the introduction session, participants assigned to the MPE condition had their photographs taken. To create the 3D images a total of 27 photographs were taken. Each participant's full portrait, seated portrait, and head and shoulders portrait was taken at each 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°, and 360° relative to the cameras' line of sight. Participants were instructed to wear comfortable clothing and present themselves as they would for any photographic opportunity. They were also requested not to wear black as this was the colour of the background and affected the quality of the photographs. While the 3D images were being developed by the

researcher, participants listened to the first CD included in Jon Kabat-Zinn's *Mindfulness Meditation: Cultivating the Wisdom of Your Body and Mind* abridged audiobook (Kabat-Zinn, 1995). This 55-minute disc describes concepts of mindfulness breathing, self-compassion, awareness, and mindfulness in daily living.

After listening to this first CD, the MPE procedures were reviewed with participants and they were provided with a DVD containing a slide show of their 3D images paired with two mindfulness exercises. Participants were also provided with glasses required for viewing the 3D imaging and, when requested, earphones to listen to the guided mindfulness instructions.

TP2. During the introduction session, those assigned to the TP2 condition viewed the 15-minute Introduction DVD segment of TP2 and read a hard copy of the Introduction chapter of the accompanying web-based manual, which reviewed the keys concepts discussed in the DVD segments. Each TP2 participant was provided with the 14-segment TP2 DVDs and an online manual internet link (http://www.turningpointsprogram.com) for their use when completing the segments at home. After viewing the Introduction segment, TP2 participants completed a brief online survey inquiring about their perceptions of the specific segment.

During the introduction sections for each condition, questions and concerns regarding procedures or participants' abilities to fully participate in the program were addressed by the experimenter. Prior to leaving the introduction session, participants completed an intervention credibility and expectancy measure (Appendix O). They were provided with the contact details of the experimenter and invited to communicate through

email, telephone, or in-person meetings should they have any questions or concerns about their programs.

Intervention daily procedures

MPE. Participants assigned to the MPE condition alternated between two mindfulness exercises while viewing their 3D image. The exercises lasted approximately 12 and 20 minutes and were extracted from Jon Kabat-Zinn's *Mindfulness Meditation: Cultivating the Wisdom of Your Body and Mind* abridged audiobook (Kabat-Zinn, 1995). The 12-minute exercise emphasized skills of mindfulness breathing meditation. The 20-minute exercise emphasized acceptance, nonjudgmental moment-to-moment-awareness, forgiveness, and self-compassion. The participants viewed their respective images on a computer screen while wearing the red-blue anaglyph glasses to produce a 3D effect. Participants were instructed to allot approximately 20 to 25 minutes each day to the completion of one of the two MPE exercises (alternating between the 12 and 20 minute exercise). After completing the exercise they completed the online TMS (Lau et al., 2006). The MPE exercise and questionnaire were completed in one block of time, but at any time of the day convenient for the participant.

Each morning, the researcher emailed each participant a reminder to complete the TMS as well as an internet link to be visited after the exercise. When the participant clicked on the link they were prompted to complete the TMS. The software program used to collect the participant's responses also collected the time and date of their responses. This allowed for the researchers to observe if participants were completing one exercise (rather than several) each day.

TP2. Participants assigned to the TP2 condition participated in the *Turning Points for Teens* program (Davis et al., 2004). This program was developed at Lakehead University and funded by the Ontario Ministry of Health and Long-Term Care from the Health Canada Primary Care Health Transition Fund. In addition to an Introduction and Goodbye segment, TP2 comprised of 12 video segments depicting University women addressing issues of body image (3 segments), healthy eating (3 segments including a discussion with a dietician), physical activity and mood regulation (3 segments), and relationships (3 segments). Each segment is approximately 15 minutes in length and accompanied by a manual chapter which reviews and elaborates upon the content of the videos.

Participants were instructed to watched one 15-minute TP2 segment per day, read the accompanying chapter in the online manual and, if they chose, complete the corresponding chapter exercise. Each morning, the experimenter emailed a link to an online questionnaire containing six questions gleaning their impressions of the video and the exercises included in the manual (see Appendix P).

Both the MPE and TP2 participants were instructed that all exercises and questionnaires should be completed in a private, quiet, comfortable location. If participants had difficulties accessing a computer or location where they could receive privacy, they were invited to use the laboratory at a pre-arranged time in order to complete the daily assignment. None of the participants required this accommodation. After completing the 14-day program, participants were emailed a link to the postintervention questionnaire. This final questionnaire contained the same measures as the baseline questionnaire.

Results

Approach to Data Analysis

All raw data gathered from SurveyMonkey was downloaded into a Microsoft Excel file via the "All Responses Collected," "Condensed," "Numerical Value (1-*n*)" menu options. Downloaded Excel files were then imported into the Statistical Package for the Social Sciences (SPSS) GradPack 17.0. To correct for numerical values that are automatically assigned to variables by SurveyMonkey, imported values were transformed to appropriate numeric values that are designated by the instrument's scoring instructions.

The presentation of results is organized along the following lines of inquiry. First, potential baseline differences between the MPE and TP2 groups were examined using univariate ANOVA. Second, in order to gain an understanding of the degree to which intervention participants were typical of the population from which they were drawn, their performance on the outcome measures at baseline were compared to the population of all women who completed such. Third, the efficacy of the interventions was evaluated using an intent-to-treat MANOVA involving a one-between (intervention group: MPE versus TP2), one-within (time: baseline versus postintervention) factorial analytic design. As MANOVA and ANOVA are sensitive to extreme scores (Tabacknick & Fidell, 2007), data were first screened for potential outliers above $z = 3.29$; none were found. The dependent variables were separated into primary and secondary categories and separate MANOVA was conducted upon each category. As the main purpose of the study was to investigate the impact of the interventions on body image, all such seven indices were included in the primary outcome category: CSAW-Affective, CSAW-Attitude, EDI-2-BD, BCQ, BIAQ, EDE-Q SC, EDE-Q-WC. Secondary dependent

variables were all seven remaining outcome measures: EDE-Q-EC, EDE-Q-R, DRES, RSE, PANAS-PA, PANAS- NA, and K6. Fourth, the potential efficacy of the interventions in improving mindfulness was tested with ANOVA procedures. Potential linear associations between change scores on measures of mindfulness and change scores on body image were also explored using Pearson correlation analyses. Finally, an exploratory analysis of the potential moderating role of negative affect upon body image outcome was examined through ANOVA and correlation analyses.

Participants

Five hundred and eighty-seven women completed and returned the online questionnaire. Seventy-five of these women were excluded from further consideration; 10 were pregnant, 65 were receiving treatment for an eating or mood disorder. Thus, a total of 512 women comprise the population from which intervention participants were drawn. Two hundred and fifty-eight women (50% of the population) expressed on the online questionnaire their interest to learn more from the researcher about the body image improvement program. All of these women were invited via email to participate in the program. A total of 60 such women (23% of those who expressed interest) were actually enrolled in the program and comprise the intervention sample. Although recruitment methods did not employ systematic means of obtaining reasons for why the majority of initially interested individuals did not ultimately participate, a few anecdotal reports mentioned inability to meet the time requirements and no need for bonus points.

Baseline group differences. The online questionnaire served as the baseline pre-intervention assessment. The means and standard deviations of participants' scores at baseline and postintervention are displayed in Table 1.

Table 1

Descriptive Statistics of the Variables as Functions of Intervention Group and Time

	Baseline				Postintervention			
	MPE		TP2		MPE		*TP2*	
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
EDE-Q								
Restraint	1.69	1.28	1.92	2.02	1.54	1.57	1.50	1.74
Eating Concern	1.30	1.44	1.79	1.68	.79	1.01	1.55	1.63
Shape Concern	2.84	1.81	3.02	1.73	2.19	1.69	2.60	1.75
Weight Concern	2.22	1.78	3.02	1.73	1.87	1.57	2.19	1.67
EDI-2-BD	11.00	7.54	9.59	6.99	8.81	6.40	8.41	6.25
CSAW								
Attitude	36.84	16.36	41.10	18.78	31.16	13.03	33.62	17.15
Affect	.39.87	21.23	39.76	20.75	33.65	16.99	35.00	19.02
BCQ	56.10	19.63	57.86	19.15	50.65	17.84	54.55	17.14
BIAQ	31.16	12.81	32.69	13.60	28.29	12.91	30.38	14.19
DRES	2.77	1.06	2.91	1.13	2.47	1.13	2.69	1.19
RSE	28.48	5.15	29.10	5.75	30.87	4.67	29.84	5.68
PHLMS								
Awareness	34.87	6.21	38.14	5.41	35.68	4.49	37.66	5.18
Acceptance	29.58	7.25	28.21	7.98	32.55	5.58	29.24	4.49
PANAS								
K6	7.06	3.70	7.79	3.70	5.97	3.46	7.28	4.67
Positive Affect	31.18	6.46	32.41	6.73	34.09	6.92	32.62	7.48
Negative Affect	22.03	6.81	24.72	7.60	19.70	6.37	23.69	8.04

Note. EDE-Q = Eating Disorder Examination Questionnaire; EDI-2-BD = Eating Disorder Inventory-2- Body Dissatisfaction Scale; CSAW = Concerns for Shape and Weight Scale; BCQ = Body Checking Questionnaire; BIAQ = Body Image Avoidance Questionnaire; DRES = Dutch Restrained Eating Scale; RSE = Rosenberg Self-Esteem Scale; PHLMS = Philadelphia Mindfulness Scale; K6 = Kessler 6-Item Psychological Distress Scale; PANAS = Positive and Negative Affect Schedule.

All potential group differences at baseline were investigated utilizing univariate ANOVA for each primary and secondary outcome dependent variables. No such significant differences were detected. Participant age did not differ between the MPE ($M = 24.77$, $SD = 9.14$) and the TP2 ($M = 22.00$, $SD = 5.36$) groups, $F(1, 59) = 2.02$, $p = .16$. However, the Body Mass Index (BMI) of the MPE group ($M = 26.23$, $SD = 5.26$) was significantly greater than the TP2 group, $M = 23.24$, $SD = 4.78$, $F(1, 59) = 5.29$, $p = .03$. Nevertheless, BMI was uncorrelated with change scores on any of the outcome variables

when analyzed through Pearson correlations both within intervention groups and collapsed over groups.

Credibility and confidence ratings. The MPE and TP2 groups did not differ in their ratings of perceived credibility or confidence in their respective interventions. When asked "how credible is this intervention regarding its ability to help people feel less distress about their bodies on a scale from 0 (*no credibility*) to 100 (*maximum credibility*)," the MPE group provided a mean rating of 72.63 (SD = 16.24) and the TP2 group provided a rating of 77.48, SD = 17.51, $F(1, 58) = 1.22$, $p = .28$. When asked to indicate their "confidence that this intervention will help you with your body image on a scale from 0 (*no confidence*) to 100 (*maximum confidence*)," participants in the MPE group rated their confidence in the intervention at M = 66.37 (SD = 18.07) and the TP2 group provided a mean confidence rating of M = 70.26 (SD = 19.09), $F(1, 58) = 0.65$, $p = .42$.

Completion and Compliance Rates

Intervention completion. Of the 60 participants enrolled in the study, 52 (87%) completed the postintervention online questionnaire and these individuals were deemed to be completers. Three of 29 TP2 participants (10%) and 5 of 31 MPE participants (16%) were classified as dropouts over failure to complete the postintervention questionnaire.

Intervention compliance. On the morning of each day the researcher emailed to all participants a compliance reminder. Those participants in the MPE condition were reminded to complete the MPE exercise. They were also provided with an internet link to the daily online questionnaire involving the TMS state measure of mindfulness to be

filled in and returned immediately following completion of the MPE exercise. Participants in the TP2 condition were emailed a reminder to watch the next video segment. They were also provided with two internet links. The first link was to the TP2 website containing the corresponding written psychoeducation chapter pertaining to the particular video segment of the day. Each chapter also contained optional relevant homework activities. The second link was to the daily online questionnaire containing two questions enquiring if they had read the online chapter and completed the optional homework activities, and additional questions pertaining to participants' experiences of the TP2 video segment (see Appendix P). The researcher monitored via SurveyMonkey activity each participant's completion of the daily online questionnaire. When the participant reached their final MPE exercise or TP2 video segment they were emailed the internet link to the online postintervention questionnaire and thanked for their participation.

Table 2 displays the number of daily online questionnaires completed by study completers and dropouts. As participants were instructed to complete the questionnaire immediately after each MPE exercise or TP2 segment, the number of completed daily online questionnaires served as an indicator of intervention compliance. As displayed in Table 2, 22 of 26 TP2 completers were fully compliant by watching all 14 DVD segments. The remaining 4 completers viewed 13 of the 14 required segments[1]. Among

[1] A review of TP2 participants' responses regarding use of the online chapter links revealed that 87% of the time TP2 participants read the online chapter corresponding with the particular video segment of the day. However, only 26% of the time did they complete the optional homework activities included in the chapters.

the 26 MPE completers, 3 completed 9-11 MPE exercises, 17 completed 12-14 exercises, while 6 exceeded the required number of 14 by completing 15-17 exercises. [2]

Table 2

Number of MPE Exercises or TP2 Video Segments Completed by Intervention Group and Study Completion Status

	TP2 (n = 29)		MPE (n = 31)	
No.	Completed	Dropped out	Completed	Dropped out
1	0	0	0	2
2	0	0	0	0
3	0	0	0	1
4	0	1	0	0
5	0	0	0	0
6	0	0	0	0
7	0	1	0	0
8	0	0	0	0
9	0	0	1	1
10	0	0	1	0
11	0	0	1	0
12	0	0	6	0
13	4	1	7	1
14	22	0	4	0
15	-	0	3	0
16	-	0	1	0
17	-	0	2	0
Total	26	3	26	5

The mean number of exercises completed by all 31 participants initially enrolled in the MPE condition was M = 11.97 (SD = 3.93). The mean number of TP2 video segments viewed by all 29 enrollees was M = 13.24 (SD = 2.21). The two intervention groups did not significantly differ in their respective compliances rates, $F(1, 59) = 2.35$, $p = .13$.

[2] A possible reason why 6 MPE participants exceeded the 14 assigned exercises may have been due to their use of the same email reminder to link to the daily online exercise rather than opening the new email reminder that was sent each day. Using the same email link every day may have resulted in failure to open and use the specific link to the final postintervention questionnaire at the appropriate time.

The use of the online daily questionnaire also allowed the researcher to view the timing of completing TP2 video segments and MPE exercises. Although participants were instructed to complete only one of these each day over 14 consecutive days, a review of the dates that participants completed the daily online questionnaires revealed this was not always the case.

The average span of days that MPE participants took to complete the intervention was $M = 16$ ($SD = 7$). Approximately 5% of all days in which participants completed the online questionnaire involved the completion of two or more exercises in the same day. Reviewing the dates of segment completion for the TP2 participants revealed an average span of $M = 22$ days ($SD = 12$) to complete the intervention. Approximately 43% of the total number of TP2 segments were viewed on the same day as at least one other segment.

In summary, compliance rates regarding the number of MPE exercises completed or TP2 video segments viewed were very high. The MPE intervention group adhered to the protocol of one exercise per day. However, compliance to the same daily regimen was lower among those in the TP2 intervention group.

Psychometric Properties of the Dependent Variables

Indices of internal consistency and descriptive statistics for the 14 dependent variables are presented separately for the population of $N = 577$ (Table 3) participants that completed the initial online questionnaire and the $n = 60$ intervention participants (Table 4). Cronbach's α coefficients are .8 or higher across all measures within the population and the sample. Magnitude of correlation among the variables is also high and statistically significant in most instances (see Appendix Q).

Table 3

Scale Reliability Coefficients of the Measures and Population (N = 577) Descriptive Statistics

Measure	Cronbach's α	Number of items	Possible range	Actual range	*M*	*SD*
EDE-Q						
Restraint	.85	5	0-6	0-6	1.38	1.39
Eating Concern	.86	5	0-6	0-6	1.18	1.31
Shape Concern	.93	8	0-6	0-6	2.56	1.69
Weight Concern	.86	5	0-6	0-6	2.24	1.63
EDI-2-BD	.89	9	0-27	0-27	9.93	7.25
CSAW						
Attitude	.93	22	0-88	4-83	36.23	15.99
Affect	.98	18	0-72	0-72	36.95	18.98
BCQ	.94	23	23-115	23-114	53.24	17.40
BIAQ	.85	19	0-95	7-80	28.79	12.34
DRES	.94	10	10-50	10-50	25.49	9.70
RSE	.88	10	10-40	13-40	29.99	4.97
PHLMS						
Awareness	.80	10	1-50	13-50	35.70	5.91
Acceptance	.88	10	1-50	10-50	29.66	7.51
K6	.81	6	0-24	0-20	7.32	3.93
PANAS						
Positive Affect	.89	10	10-50	11-49	32.64	7.18
Negative Affect	.85	10	10-50	10-45	22.51	6.86

Note. EDE-Q = Eating Disorder Examination Questionnaire; EDI-2-BD = Eating Disorder Inventory-2- Body Dissatisfaction Scale; CSAW = Concerns for Shape and Weight Scale; BCQ = Body Checking Questionnaire; BIAQ = Body Image Avoidance Questionnaire; DRES = Dutch Restrained Eating Scale; RSE = Rosenberg Self-Esteem Scale; PHLMS = Philadelphia Mindfulness Scale; K6 = Kessler 6-Item Psychological Distress Scale; PANAS = Positive and Negative Affect Schedule.

Table 4 depicts the standard score and percentile equivalent of the intervention sample's mean score at baseline relative to population ($z_M = [M - \mu]/[\sigma^2/n]$) on all variables. The intervention sample percentile score equivalents range from a low of 44% (RSE) to a high of 73% (EDEQ- EC), with a mean percentile equivalent of 59%. On all three indices of dieting behaviour (EDE-Q-R, EDE-Q-EC, and DRES) and one measure of body image, the sample mean scores were statistically significantly higher relative to

the population. This was determined with the use of the one-sample *z*-test of null hypothesis that intervention sample and population means are equal.

Table 4

Scale Reliability Coefficients of the Measures and Intervention Group (n = 60) Descriptive Statistics

Measure	Cronbach's α	Number of items	Possible range	Actual range	*M*	*SD*	z^a	P^b
EDE-Q								
Restraint	.88	5	0-6	0-6	1.80	1.67	2.34*	71
Eating Concern	.87	5	0-6	0-6	1.54	1.57	2.13*	73
Shape Concern	.93	8	0-6	0-6	2.93	1.76	1.68	61
Weight Concern	.90	5	0-6	0-6	2.40	1.83	.76	60
EDI-2-BD	.89	9	0-27	0-27	10.32	7.25	.41	59
CSAW								
Attitude	.95	22	0-88	9-79	38.99	17.55	1.34	59
Affect	.99	18	0-72	0-72	39.82	20.82	1.17	52
BCQ	.95	23	23-115	25-114	57.00	19.40	1.68	64
BIAQ	.85	19	0-95	12-60	31.90	13.10	1.96*	68
DRES	.96	10	10-50	10-50	28.37	10.87	2.30*	62
RSE	.90	10	10-40	18-39	28.78	5.41	-1.89	44
PHLMS								
Awareness	.80	10	0-40	12-50	36.45	6.02	.99	56
Acceptance	.90	10	0-40	14-43	29.92	7.58	.27	54
K6	.77	6	0-24	1-17	7.42	3.68	.20	57
PANAS								
Positive Affect	.88	10	10-50	17-46	31.78	6.57	-.92	46
Negative Affect	.84	10	10-50	11-40	23.33	7.27	.92	59

Note. EDE-Q = Eating Disorder Examination Questionnaire; EDI-2-BD = Eating Disorder Inventory-2 Body Dissatisfaction Scale; CSAW = Concerns for Shape and Weight Scale; BCQ = Body Checking Questionnaire; BIAQ = Body Image Avoidance Questionnaire; DRES = Dutch Restrained Eating Scale; RSE = Rosenberg Self-Esteem Scale; PHLMS = Philadelphia Mindfulness Scale; K6 = Kessler 6-Item Psychological Distress Scale; PANAS = Positive and Negative Affect Schedule.

z^a = one-sample z-test of null hypothesis that intervention sample and population means are equal. P^b = percentile of sample mean relative to population.

*$p < .05$

These results suggest the intervention sample was statistically "normal" on most dependent variables to begin with, most notably on the primary outcome variables measuring body image for which the interventions were designed to target. Any resulting changes on these measures over the course of the interventions can therefore not be attributable to a regression toward the mean effect.

Efficacy Analysis of Primary Outcomes

The convention in efficacy outcome analysis is the use of the intent-to-treat strategy whereby all participants are analyzed. Replacing missing postintervention scores of the dropouts with baseline scores has been deemed the most feasible option for ITT analysis in clinical studies such as the present (Hollis & Campbell, 1999). This was done in the 8 instances whereby participants failed to complete the postintervention questionnaire. A one-between (group), one-within (time) MANOVA was conducted on the seven primary outcome measures of body image. A significant multivariate time main effect was observed; Wilks' $\Lambda = .63$, $F(7, 52) = 4.39$, $p = .001$, $\eta_p^2 = .37$. Neither the intervention group main effect [Wilks' $\Lambda = .92$, $F(7, 52) = 0.65$, $p = .72$, $\eta_p^2 = .08$] nor the Time X Group interaction proved to be statistically significant; Wilks' $\Lambda = .90$, $F(7, 52) = 0.84$, $p = .56$, $\eta_p^2 = .10$.

Follow-up univariate one-within (time) ANOVAs were conducted separately for each of the seven primary outcome measures of body image. Corresponding Levene's tests for homogeneity of variance were nonsignificant for each of the measures. To maintain the family-wise type I α at .05, the per-comparison error rate was Bonferroni adjusted as follows; .05/7 tests =.007. All individual time effects were statistically

significant (see Table 5). These findings indicate that participants reported improvements in their body image regardless of the intervention they received.[3]

Table 5

Univariate Tests of the Time Main Effect for the Primary Outcome Measures of Body Image

	Baseline		Postintervention				
Measure	*M*	*SD*	*M*	*SD*	*F*	*p*	η_p^2
CSAW- Affective	39.82	20.82	34.30	17.86	12.24	.001	.174
CSAW- Attitude	38.90	17.55	32.35	15.08	14.79	< .001	.203
EDI-2-BD	10.32	7.25	8.62	6.28	9.03	.004	.135
BCQ	56.95	19.26	52.53	17.47	11.49	.001	.165
BIAQ	31.90	13.10	29.30	13.47	10.44	.002	.152
EDE-Q-SC	2.93	1.76	2.37	1.72	18.90	<.001	.246
EDE-Q-WC	2.40	1.83	2.02	1.61	8.70	.005	.130

Note. CSAW = Concerns for Shape and Weight Scale; EDI-2-BD = Eating Disorder Inventory-2 Body Dissatisfaction Scale; BCQ = Body Checking Questionnaire; BIAQ = Body Image Avoidance Questionnaire; EDE-Q-SC = Eating Disorder Examination Questionnaire Shape Concern; EDE-Q-WC = Eating Disorder Examination Questionnaire Weight Concern. Time effect $df = 1$, error $df = 58$. All tests are statistically significant at the Bonferroni adjusted per-comparison type I error-rate = .007.

Efficacy Analysis of Secondary Outcomes

A one-between (group), one-within (time) MANOVA was conducted on the seven secondary outcome measures. A significant multivariate time main effect was observed; Wilks' $\Lambda = .61$, $F(7, 52) = 4.68$, $p = .001$, $\eta_p^2 = .39$. Neither the intervention group main effect [Wilks' $\Lambda = .80$; $F(7,52) = 1.92$, $p = .09$, $\eta_p^2 = .21$] nor the Time X Group interaction were found to be statistically significant; Wilks' $\Lambda = .85$; $F(7, 52) = 1.28$, $p = .28$, $\eta_p^2 = .15$.

[3] Identical analysis on only those participants who completed the study produced results that were not materially different from the intent-to-treat findings that are presented here (see Appendix R for completer analysis).

Follow-up univariate one-within (time) ANOVAs were conducted separately for each of the seven secondary outcome measures. Levene's test for homogeneity of variance were nonsignificant for six of the secondary variables. As variance between the two groups did significantly differ on the EDE-Q-EC postintervention ($p = .01$), natural logarithmic transformations were performed on these scores (Tabachnick & Fidell, 2007). To maintain the family-wise type I α at .05, the per-comparison error rate was again adjusted to .007. Univariate ANOVAs on the EDE-Q-EC, DRES, and RSE were significant for the time main effect. However, the time main effect was nonsignificant for the EDE-Q-R, PANAS- PA, PANAS- NA, and K6 (see Table 6). Participants reported improvements in self-esteem and reductions in eating concerns and dieting behaviours regardless of the intervention they received.[4]

Exploratory Analysis of Mindfulness

The above analyses which address the primary differential efficacy objective of the present study revealed that participants improved in body image, self-esteem and dieting behaviour regardless of the intervention that they received. A second objective of the study was to explore mindfulness in three ways: (a) to investigate potential differential efficacy of MPE and TP2 in improving the mindfulness traits of awareness and acceptance; (b) to examine separately within the two interventions the degree of linear association between change scores on *trait* measures of mindfulness and change scores on body image; and (c) to examine the association between changes scores on *state*

[4] Identical analysis on only those individuals who completed the study postintervention online questionnaire produced results that were not materially different from the intent-to-treat findings (see Appendix R).

measures of mindfulness and change scores on body image specifically within the MPE group[5].

Table 6

Univariate ANOVA for Secondary Outcome Measures

	Baseline		Postintervention				
Measure	*M*	*SD*	*M*	*SD*	*F*	*p*	η_p^2
EDE-Q-EC	1.54	1.57	1.16	1.39	14.112 [a]	<.001*	.196
EDE-Q-R	1.80	1.67	1.52	1.64	6.110	.016	.095
DRES	2.84	1.09	2.58	1.15	21.870	<.001*	.274
RSE	28.78	5.41	30.37	5.17	15.723	<.001*	.213
PANAS-PA	31.78	6.57	33.38	7.17	2.750	.103	.045
PANAS-NA	23.33	7.27	21.63	7.44	5.662	.021	.089
K6	7.42	3.68	6.60	4.11	5.315	.025	.084

Note. EDE-Q-EC = Eating Disorder Examination Questionnaire Eating Concern; EDE-Q-EC = Eating Disorder Examination Questionnaire Restraint; DRES = Dutch Restrained Eating Scale; RSE = Rosenberg Self-Esteem Scale; PHLMS = Philadelphia Mindfulness Scale; PANAS = Positive and Negative Affect Schedule; K6 = Kessler 6-Item Psychological Distress Scale. Time effect $df = 1$, error $df = 58$.
[a] F, p, and η_p^2 for EDE-Q-EC reflect values that were transformed through the natural log of the raw scores, while M and SD reflect the descriptive statistics of the untransformed values.
* statistically significant at the Bonferroni adjusted per-comparison type I error-rate = .007.

Efficacy analysis of trait mindfulness. Trait mindfulness was measured at baseline and postintervention with the PHLMS Awareness and Acceptance subscales. Regarding Acceptance, the two groups did not differ at baseline, $F(1,59) = 0.49$, $p = .45$, $\eta_p^2 = .01$. Analysis of Acceptance scores using a one within (time) X one between (group) ANOVA produced a time main effect, $F(1,58) = 5.08$, $p = .03$, $\eta_p^2 = .08$. There was no significant group main effect [$F(1,58) = 1.91$, $p = .17$, $\eta_p^2 = .03$] or Time X

[5] The Toronto Mindfulness Scale (TMS; Lau et al., 2006) was originally developed to be completed immediately following a mindfulness meditation session and, thus, its use in the present study was appropriately limited only to the MPE participants following each daily session.

Group interaction, $F(1,58) = 1.19, p = .28, \eta_p^2 = 02$. These findings indicate that participants reported greater acceptance over time regardless of the intervention they received. Comparable analysis using Awareness scores failed to produce any main or interaction effect.

Association between change scores in trait mindfulness and body image. To reduce the number of correlations that would otherwise be involved, to maintain control over family-wise type I error, and in recognition of the strong intercorrelations among the measures, a body image composite scale score was formed by averaging the standardized scores across each of the seven primary outcome variables; CSAW-Affective, CSAW-Attitude, EDI-2-BD, BCQ, BIAQ, EDE-Q-SC, EDE-Q-WC. The metric used was $z = X-\mu/\sigma$, where X denotes participants' raw score on the variable, and this was calculated separately for the baseline scores and the postintervention scores. Finally, a body image composite change score was produced by subtracting baseline from postintervention composite scores. A change score was also created for PHLMS trait Awareness and Acceptance by subtracting baseline from postintervention. Change scores on body image were then subjected to a Pearson correlation analyses with change scores on the two subscales of trait mindfulness. Change in Awareness was uncorrelated with change in body image in either group. Regarding Acceptance, this measure correlated significantly with improvements in body image within the MPE group [$r(29) = .50, p = .004$], but not within the TP2 condition, $r(27) = .07, p = .718$. As MPE participants reported enhanced acceptance over the course of the intervention, so too did they report improved body image.

Association between change scores in state mindfulness and body image in the MPE intervention. MPE participants' TMS Decentering and Curiosity subscales scores from the first time they completed a MPE exercise were compared with the average scores on the respective scales from the second to their final MPE exercise. One-within (time) ANOVA revealed that participants did not significantly improve in decentering [$F(1,27) = 3.61, p = .07, \eta_p^2 = .12$] or curiosity, $F(1,27) = 0.72, p = .41, \eta_p^2 = .03$. Pearson correlation analyses revealed that changes in body image were unrelated to changes in Decentering [$r(29) = .28, p = .14$] and Curiosity, $r(29) = .19, p = .33$.

Exploratory Analysis of Negative Affect

Given empirical work demonstrating that mindfulness training appears to be beneficial for those individuals with a history of depressive symptomatology, we explored whether negative affect differentially influenced the primary outcome of body image in the two interventions. A composite score for negative affect was created by averaging standardized scores on the PANAS Negative Affect and the K6 at baseline[6]. All participants in the this intent-to-treat analysis were then classified as low or high on negative affect based upon a median split of their baseline composite score. Potential MPE and TP2 group differences in baseline composite body image scale scores among those high and low in negative affect were investigated utilizing univariate ANOVA. Among those high in negative affect, the baseline composite body image scale scores between the MPE ($M = .82$, $SD = .81$) and TP2 groups ($M = .60$, $SD = 1.00$) did not differ, $F(1, 29) = .46, p = .51$. Among those low in negative affect, baseline composite body

[6] As depicted in Table Q, the Pearson correlation between PANAS Negative Affect and K6 at baseline was $r = .72$ in the population and .73 in the intervention sample.

image scale scores in the MPE (M = -.53, SD = .51) and TP2 groups (M = -.20, SD = .72) also did not differ on according to group, F (1, 29) = 2.15, p = .15.

To investigate the potential moderating effect of negative affect upon body image outcome, a two-way (negative affect: low versus high X intervention group: TP2 versus MPE) between-groups ANOVA was conducted on the dependent variable of composite body image change scores where baseline was subtracted from postintervention. A significant Negative Affect X Group interaction emerged which is depicted in Figure 1, $F(1, 56) = 8.26, p = .006, \eta_p^2 = .13$. Among those individuals high in baseline negative affect, the MPE intervention produced greater improvements in body image over the course of the intervention compared to participants in the TP2 intervention, $F(1, 28) = 5.25, p = .03, \eta_p^2 = .16$. There was no differential intervention effect among participants who were low in baseline NA, $F(1, 28) = 3.06, p = .09, \eta_p^2 = .10$.

A negative affect change score was then computed by subtracting participants' baseline from postintervention composite scores. This variable correlated positively and significantly with body image composite change scores among participants in the MPE intervention, $r(29) = .68, p < .01$. This relationship was not significant in the TP2 group $r(27) = .18, p = .34$. Collectively, the results of these exploratory analyses suggest that individuals prone to experience heightened negative affect may be better served by a trial of MPE intervention for their body image problems.

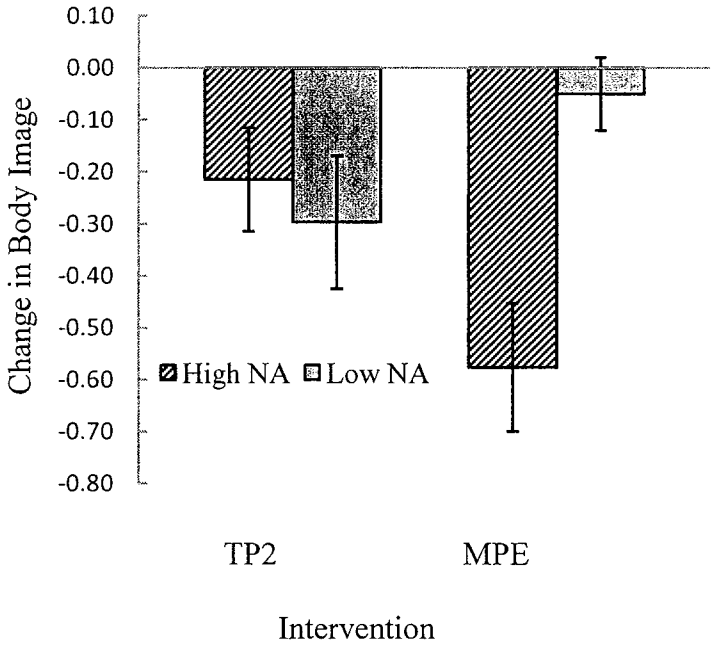

Figure 1. Mean change in composite body image z-scores (±*SE*) for TP2 and MPE participants with high and low baseline composite negative affect (NA).

Discussion

The present study sought to investigate the efficacy of a mindfulness- based intervention coupled with 3D exposure to improve body image in women. The intervention was compared to TP2, a treatment with demonstrated success in reducing shape and eating concerns when implemented in a group setting with young women (Bone, 2006). Ratings provided by participants prior to the intervention supported the notion that TP2 and MPE were deemed equally credible and potentially helpful in improving body image. Participants in the both the MPE and TP2 conditions demonstrated improvements in body image over the course of their interventions. In addition, both groups demonstrated an increase in self-esteem and decreases in dieting

behaviour and eating concerns. Neither group demonstrated reductions in negative affect nor increases in positive affect following the intervention.

Given the relative success of both interventions in improving body image, one is left wondering from which intervention to choose. Both interventions can be self-administered. However, the TP2 intervention does not require the special equipment (e.g., apparatus for creating 3D images) necessary in the MPE condition. In addition, the TP2 program appears to be particularly durable to deviations from protocol. Despite instruction to only watch one segment per day, it was common for participants to view two or more segments per day. Nevertheless, improvements in body image, eating concerns, and self-esteem were reported. In summary, although both interventions appear to be equally effective, due to its ease of administration TP2 may be the treatment of choice for healthy women presenting with normal levels of body image concerns.

However, women with body image concerns coupled with elevated negative affect may benefit from a MPE intervention. Exploratory analyses revealed that participants high in negative affect demonstrated significantly improved body image following the MPE intervention compared to the TP2 program. The reasons as to the selective benefit of MPE in improving body image in this group of women remain speculative. Previous work has demonstrated that mindfulness training is helpful in reducing negative affect (Michalak et al., 2008; Ramel et al., 2004; Teasdale et al., 2000). As such, it is very possible that individuals who are best served by mindfulness treatments are particularly lacking in mindfulness skills. The absence of these skills may also contribute to body image disturbance. For the women in this study experiencing both negative body image and negative affect, learning and practising these mindfulness

skills may have been a particularly relevant and potent method of addressing both issues simultaneously.

The finding that reductions in negative affect were significantly correlated with reductions in body image in the MPE condition, but not the TP2 group may also provide some insight as to why the MPE intervention was particularly beneficial for women with elevated negative affect. These differential results suggest that the mechanisms behind body image improvement in each group may be different. In the TP2 group it is possible that the decrease in body dissatisfaction occurred through the psychoeducational and normalizing nature of the program. These mechanisms appear to have equally affected those high and low in negative affect. However, in the MPE intervention, improvements in body image may have occurred through mechanisms which also influence negative affect.

However, it is important to note that participants in this study did not report significant reductions in negative affect over the course of the intervention. This could have been due to the fact that the participants were not particularly high in negative affect to begin with and significant improvements could not be expected in such a healthy group. It also highlights that in the present study improvements in affect were not necessary in order to achieve significant improvement in body image.

Role of Mindfulness

Whether the mindfulness component of the MPE condition served as the therapeutic agent of change for the improvements in body image or eating concerns remains inconclusive. It is possible that mere repeated exposure to their 3D image, without engaging in mindfulness, may have contributed to the MPE group's

improvements. For example, Riendeau (2007) investigated the effects of exposure to the two-dimensional (2D) and 3D images of young women on their body image. One group of participants was instructed to simultaneously engage in nonjudgmental self-description (NSD), a mindfulness based approach whereby participants are instructed to view their image while giving equal attention to all body parts and avoiding use of critical or negative language. A second group was given no specific instructions while viewing their image. Results were contrary to previous research (Delinsky & Wilson, 2006; Shafran et al., 2007) supporting the utility of a NSD approach to body image exposure in improving body image. Those in the NSD condition did not demonstrate significant improvements in body dissatisfaction after exposure to their 3D image. Riendeau proposes that the beneficial effect of the NSD viewing instruction may have been negated by the interference from the novel nature of their 3D image.

However, among Riendeau's participants with elevated body dissatisfaction, those who simply viewed their 3D images without instruction reported significantly decreased body dissatisfaction from pre- to post-exposure. Riendeau proposed that when viewing their images in 3D, those with elevated body dissatisfaction may temporarily refrain from engaging in automatic thoughts related to negative body schemas. In her study, these improvements in body image occurred after less than a total of 3 minutes of exposure to their image. In the present study, participants in the MPE condition were exposed to their 3D image for an average of more than 240 minutes. It is possible that even without engaging in mindfulness practise the repeated experience of viewing their body from a novel 3D perspective may have contributed to reducing the automaticity and/or negativity of psychological responses related to their body image. Future research

should separate the mindfulness and the exposure components of the MPE condition in order to ascertain the relative influence of each in improving body image.

The necessity of a mindfulness component in achieving the improvements in body image reported in the MPE condition is further questioned through the present study's finding that the MPE group demonstrated no unique gains compared to the TP2 group in mindfulness traits of awareness or acceptance. The authors of the PHLMS Acceptance scale define acceptance as "the nonjudgemental stance towards one's experience" (Cardaciotto et al., 2008, p. 208). All participants, regardless of their intervention, significantly improved in mindfulness acceptance. These finding would suggest that mindfulness acceptance can be achieved without specific training or practice in mindfulness per se. As acceptance was not specifically addressed in the TP2 program, gains in acceptance may have been achieved through the psychoeducational nature of the program and the normalizing of cognitive and affective experiences of which participants may have previously been less accepting.

Mindfulness awareness did not improve over the course of the interventions. Awareness as operationalized in the PHLMS is "the continuous monitoring of ongoing internal and external stimuli" (Cardaciotto et al., 2008, p. 208). Mindfulness awareness was not explicitly discussed in the TP2 group. As such, a lack of improvement would be expected. However, the MPE intervention did target awareness. Yet, participants in the group did not reporter significant gains in mindfulness awareness following the intervention. It is possible that that despite mindfulness instruction and practice aimed at increasing present-moment awareness, attainment of this skill requires more than the 14 practice sessions included in the intervention. Future research which incorporates

mindfulness practice over a longer period of time could address this possibility. The lack of improvement in mindfulness awareness among MPE participants could also have been a consequence of pairing mindfulness practice with participants' 3D images. Such pairing may have served as a distracter from moment-to-moment awareness. Finally, the impact of mindfulness training on PHLMS scores has not been reported in the literature to date. Although its subscale counterpart, acceptance, was amenable to improvement over the course of the MPE intervention it is possible that awareness was not as responsive to training. Nevertheless, according to the present findings it appears that improvement in body image does not require significant gains in mindfulness awareness as measured by the PHLMS.

The TMS Decentering and Curiosity subscales were used as measures of mindfulness state immediately following each MPE exercise. Decentering on this scale is defined as "awareness of one's experience with some distance and disidentification rather then being carried away by one's thoughts and feelings" (Lau et al., 2006, p. 1452). Curiosity is defined by Lau and colleagues as the "awareness of present moment experience with a quality of curiosity." There was not a reported improvement in participants' engagement in either of these mindfulness states. The reason for this lack of improvement is uncertain. During the original psychometric evaluation of the TMS, Lau and colleagues (2006) reported that following an 8-week mindfulness based stress reduction group, participants increased in both decentering and curiosity scores. It is possible that the present sample did not demonstrate the same improvement due to the relatively shorter 2-week duration of the intervention. It is also possible

that the pairing of the mindfulness exercises with participants' 3D images somehow interfered with the development of decentering and curiosity skills during the MPE exercises. Future studies which either dismantle the mindfulness instruction from the 3D exposure, or include a longer intervention period, may be able to address this issue. Either way, it does not appear that changes in decentering or curiosity are required for improvements in body image and self-esteem or decreases eating concerns and dieting behaviours.

In summary, the present results suggest that improvement in body image does not require significant improvements in mindfulness awareness, decentering, or curiosity, as measured in the present study. Whether, a significant improvement in these mindfulness domains would contribute to even greater improvements in body image remains unknown. It is also possible that aspects of mindfulness practice not measured in the present study may have contributed to the improvements in body image, eating concerns, and self-esteem. Although acceptance and awareness are argued to be the most centrally related to the construct of mindfulness (Cardaciotto et al., 2008), other aspects specific to mindfulness may have contributed to participant improvement. For example, additional facets of describing, non-reactivity, observing, open to negative experience, attention, present-focus, and letting go (Baer et al., 2006; Baer, Smith, & Allen, 2004; Cardaciotto et al., 2008; Feldman, Hays, Kumar, & Greesom, 2004) were all encouraged in the present mindfulness intervention. However, these facets of mindfulness were not measured. Measuring a wider array of mindfulness facets in future studies may shed some light on potential mechanism of change contributing to improvements in body image.

Limitations

The methodology employed in the present study provided basis for a number of limitations. Results suggest that TP2 and MPE were associated with improvements in body image and self-esteem and reductions in eating concerns and dieting behaviour. However, the contribution of other factors to these relationships cannot be ruled out. Campbell and Stanley (1963) identified seven primary threats to internal validity: history, maturation, selection, testing, instrumentation, statistical regression, and mortality. The first four of these are particularly relevant to the limitations of the present study. Regarding the threat of history to internal validity, the potential for external yet influential events having occurred during the 2-week intervention cannot be ruled out. However, as participation was spread out over a period of almost 1 year, the influence of specific events (e.g., if eating disorders or topic related to body image was addressed in their Introduction to Psychology class) or time periods (e.g., university exams or holiday season) is not likely. Similarly, maturation, or the natural improvement of participants body image, self-esteem and eating concerns and behaviours is unlikely, but cannot be ruled out. The mere testing of participants at baseline could also have influenced their subsequent change in scores at termination. The questionnaires used for the present study are all high in face validity. By simply completing the questionnaires participants may have begun to contemplate the issues of their content. As such, influence of this heightened awareness on the present study's outcome of improved body image, self-esteem and eating concerns and dieting behaviour cannot be excluded. Future research could rule out this possibility, by including an untreated control group, who would only complete baseline and postintervention questionnaires without intervening treatment.

The influence of this study's selection methods on outcome also cannot be ruled out. Although participants were randomly allocated to their respective interventions, they were recruited to the study by self-selection. Analysis revealed that the women who volunteered for the interventions were very similar to the larger population on the key variables of interest. However, additional unmeasured factors such as motivation may have also influenced their improvements during the interventions and limit the generalizability of the present results.

In addition, mere introduction of a novel body image program to the women's daily routine may have influenced the observed improvements. Each day for approximately 20 minutes the women were giving their attention to issues of well-being. This daily attention to themselves may alone have facilitated change. Delinsky and Wison (2006) reported that in their non-directive treatment women reported significant reductions in body checking, dieting, body dissatisfaction, and depressive symptoms. This non-directive program only required women to journal and discuss with a therapist their body image, its development and influencing cultural ideals. The mere devotion of time to the awareness of one's body image and well-being may have contributed to the significant improvements demonstrated in the present study. Future research may benefit from comparing the MPE and TP2 conditions to a minimal treatment control condition.

Similarly, it is also not possible to rule out the influence of participant demand characteristics. The women who volunteered for the study were aware that that their completion of the daily exercises were recorded and at the end of the intervention they would be completing a final questionnaire. The desired outcome was obvious to participants, as the interventions were described as body image improvement programs.

As such, participants' improvements may have been influenced by their desire to produce the transparent expectations of the study.

The present study also relied entirely upon participants self-report. At no time were semi-structured interviews or observations conducted in order to ascertain the validity of participants' baseline, daily exercise, and outcome scores. For example, although participants stated that they were not actively in treatment for a mood or eating disorder, this is not to say they were not experiencing a clinical level of related symptoms or that they have not experienced these disorders in the past. In fact, among the 60 women who participated in the study and reported that they were not in treatment for an eating disorder, five reported that within the past 4 weeks they had vomited as a result of feeling as though they had eaten too much. As such, the non-clinical homogeneity of the sample cannot be assumed and further studies may benefit from more in-depth psychological interviews in order to draw conclusions about the generalizability of the results. Lastly, the present study did not include a follow-up and the durability of the observed improvements remains unknown.

Strengths and Future Directions

The present study's methodology also underlies a number of its strengths. Specifically, potential threats of instrumentation, testing, statistical regression, and mortality to internal validity are minimal (Campbell and Stanley, 1963). At baseline and termination the same questionnaires were administered using an identical, online, self-report format. As such, any changes in scores were not due to changes in the measurements themselves or their administration. With the exception of the PHLMS (Cardaciotto et al., 2008) and K6 (Kessler, et al. 2002), which at the time of this writing

do not have published test-retest reliability statistics, the present study used measurements that have demonstrated acceptable test-retest reliability over the period of at least 2-weeks. Therefore changes demonstrated in participants' scores on these instruments are not likely due to testing effects (e.g., practise).

Statistical regression also does not appear to pose a threat to the present study's internal validity. Women who volunteered to take part in this study were not particularly deviant compared to the greater population of women who completed the online baseline questionnaires. As such, one can have greater confidence that the significant improvements reported after the intervention were not a product of regression to the mean. In addition, as the women in the intervention study scored comparably to the larger population on measures of body image, restrained eating and affect, the improvements demonstrated by both intervention groups over the course of their intervention would appear to be generalizable to a non-clinical population of young women.

Another strength of this study lies in the fact that attritions rates in both interventions were low. Furthermore, those individuals who did not complete the intervention were not different from participants on any demographic, confidence and credibility, or outcome variables at baseline. Sixteen percent and 10% of participants in the MPE and TP2 conditions, respectively, did not complete the postintervention questionnaire. Although reported attrition reports in psychotherapy vary greatly, these rates are comparable and in some cases below other self-help body image intervention programs (Grant & Cash, 1995; Cash & Lavallee, 1997; Strachan & Cash, 2002). As young people tend to have higher treatment dropout rates than older adults, interventions

such as those presented here which are successful and demonstrate low attrition are particularly unique and worthy of attention (Edlund et al., 2002).

It is important to note that the mindfulness program included in this study was quite general. The mindfulness introduction and exercises did not specifically address body image, eating concerns or self-esteem. Yet significant improvements in these domains were reported. It is very possible that mindfulness-based treatments specifically targeted at body image may yield even greater improvements. Furthermore, as therapist assisted body image interventions are generally more effective than minimal or no therapist contact treatments (Jarry & Berardi, 2004), it is arguable that incorporating a higher degree of therapist involvement might bring about even greater gains than those reported in the present study. In summary, tailoring a mindfulness intervention to body image issues in addition to increasing therapist contact could reveal even further potential of the benefits of mindfulness training.

Nevertheless, the success of MPE and TP2 interventions as delivered in the present study have promising implications for those rural or underserviced areas where individual clinician attention is not feasible. Both interventions were individually delivered and self-administered. Participants in this study met with the researcher once and then completed the interventions entirely on their own. Unlike the previous studies employing mindfulness concepts to body image (Delinsky & Wilson, 2006; Riendeau, 2007), the intervention did not require immediate researcher intervention aimed at assisting participants with addressing specific cognitive and affective responses towards their body image or eating behaviours. Yet participants in the MPE and TP2 condition demonstrated significant improvements in both of these domains. Furthermore, all

participants were offered the opportunity to meet with the researcher at any time during or after the intervention. However, none of the participants requested this meeting or reported any difficulties completing their programs. As such, it would appear that the MPE and TP2 interventions are user-friendly and require little face-to-face contact with a clinician. TP2 has an additional advantage in that, unlike MPE which requires specific equipment to construct the 3D image, it can be delivered with only a DVD player, a monitor, and an internet connection (although chapter manuals could be printed in hard copy). These attributes may prove helpful to remote areas where therapist-client contact is difficult to achieve or the availability of clinicians is limited.

The present study's results also suggest that MPE and TP2 could prove beneficial in the intervention or prevention of eating disorders. Body dissatisfaction, eating concerns and dieting behaviours have all been found to be robust predictive and maintaining factors of eating disorders (Stice et al., 2000; Stice & Bearman, 2001). MPE and TP2 simultaneously address both and may serve as a prophylactic to prevent sub-clinical concerns from escalating into an eating disorder (Levine & Smolak, 2006). Previous studies investigating the utility of acceptance and meditation-based therapies in treating disordered eating have encountered limited success. Baer, Fischer, and Huss (2005) reported that mindfulness eating and general mindfulness-based cognitive therapy techniques were associated with reductions in binge eating. However, these reductions were not accompanied with significant shifts in weight and shape concerns or depressive symptomatology. Leahey, Crowther, and Irwin (2008) reported reductions in negative affect following a mindfulness-based intervention in a group of patients endorsing symptoms of binge eating. However, in their study, improvements in affect were in the

context of significant weight loss following bariatric surgical intervention. Although weight loss may have been an appropriate health choice for this group of patients, for many young women reporting body dissatisfaction weight loss is neither a necessary nor healthy option. A program such as MPE, which achieves improved body image without requiring changes weight or shape could prove extremely beneficial in reducing young women's risk for developing an eating disorder. Future research would benefit from a substantially greater number of participants and a follow-up period to explore the relative risk of developing an eating disorder following mindfulness training. Replicating the present study in a clinical sample would also explore the utility of using MPE to treat eating disorders and related disturbed body image, eating behaviours, and affect. Future research would also benefit from a follow-up period examining the enduring benefits of the intervention when participants are not actively engaging in daily MPE exercises or viewing the TP2 segments. Although differential efficacy between the two groups was not detected in the present study, the ongoing benefits of both programs remain unknown.

In conclusion, the present study found that women engaging in mindfulness practice coupled with viewing their 3D image experienced improvements in body image and eating concerns to a similar degree as those reported by women who participated in TP2, a comparative intervention program. The low attrition rates and ease of delivery suggest that both TP2 and MPE are two viable and effective means of assisting young women with improving not only the way they feel about their bodies, but also in reducing their concomitant eating concerns. Young women presenting with high negative affect may particularly benefit from the MPE intervention in terms of improving their body image.

References

Allaz, A., Bernstein, M., Rouget, P., Archinard, M., & Morabia, A. (1998). Body weight preoccupation in middle-age and ageing women: A general population survey. *International Journal of Eating Disorders*, *23*(3), 287-294.

Allison, D. B., Kalinsky, L. B., Gorman, B. S. (1992). A comparison of the psychometric properties of three measures of dietary restraint. *Psychological Assessment*, *4*(3), 391-398.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, *10*, 125-143.

Baer, R., Fischer, S., & Huss, D. (2005). Mindfulness and acceptance in the treatment of disordered eating. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, *23*(4), 281-300.

Baer, R.A., Smith, G.T., & Allen, K.B. (2004). Assessment of mindfulness by self-report: The Kentucky Inventory of Mindfulness Skills. *Assessment*, *11*, 191-206.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*(1), 27-45.

Baer, R.A., Smith, G.T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, M. G. (2008). Construct validity of the Five Facet Mindfulness Questionnaire in meditating and nonmeditating samples. *Assessment*, *15*(3).

Bearman, S.K., Stice, E. & Chase, A. (2003). Evaluation of an intervention targeting both depressive and bulimic pathology: A randomized prevention trial. *Behavior Therapy*, *34*(3), 277-293.

Bessenoff, G.R. (2006). Can the media affect us? Social comparison, self-discrepancy, and the thin ideal. *Psychology of Women Quarterly*, *30*, 239-251.

Bishop, S. R. (2002). What do we really know about Mindfulness-Based Stress Reduction? *Psychosomatic Medicine*, *64*(1), 71-83.

Bone, M. (2006). Body and Affect Words: Valence, Cognitive Specificity, and Temporal Change Among Young Women. Unpublished master's thesis, Lakehead University, Department of Psychology.

Borkovec, T. D. (2002). Life in the future versus life in the present. *Clinical Psychology: Science and Practice*, *9*(1), 76-80.

Breslin, F. C., Zack, M., & McMain, S. (2002). An information-processing analysis of mindfulness: Implications for relapse prevention in the treatment of substance abuse. *Clinical Psychology-Science & Practice*, *9*, 275-299.

Brodie, D. A., & Slade, P. D. (1988). The relationship between body-image and body-fat in adult women. *Psychological Medicine*, *18*(3), 623-631.

Cafri, G., Yamamiya, Y., Brannick, M., & Thompson, K. (2005). The influence of sociocultural factors on body image: A meta-analysis. *Clinical Psychology*, *12*(4), 421-433.

Cairney, J., Veldhuizen, S., Wade, T.J., Kurdyak, P., Streiner, D.L. (2007). Evaluation of 2 Measures of Psychological Distress as Screeners for Depression, *Canadian Journal of Psychiatry*, *52*(2), 111-120.

Campbell, D. T. & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally.

Cardaciotto, L. Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance: The Philadelphia Mindfulness Scale. *Assessment*, *15*(2) 204-223.

Carter, J., Stewart, D.A., & Fairburn, C.G. (2001). Eating disorder examination questionnaire: Norms for young adolescent girls. *Behaviour Research and Therapy*, *39*(5), 625-632.

Cash, T.F. (2004). Cognitive-Behavioral Perspectives on Body Image. In: T.F. Cash & T. Pruzinsky (Eds.), *Body image*: *A handbook of theory, research, & clinical practice* (pp. 38-46). New York: The Guilford Press.

Cash, T.F. (2005). The influence of sociocultural factors on body image: Searching for constructs. *Clinical Psychology: Science and Practice*, *12*(4), 438-442.

Cash, T. F., & Deagle, E. A., III. (1997). The nature and extent of body-image disturbances in anorexia nervosa and bulimia nervosa: A meta-analysis. *International Journal of Eating Disorders*, *22*(2), 107-125.

Cash, T.F. & Hrabosky, J.I. (2003). The effects of psychoeducation and self-monitoring in a cognitive-behavioural program for body image improvement, *Eating Disorders*, *11*, 255-270.

Cash, T.F. & Lavallee, D.M. (1997). Cognitive-behavioural body image therapy: Further evidence of the efficacy of a self-directed program. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, *15*, 281-294.

Cash, T.F., Melnyk, S.E., & Hrabosky, J.L. (2004). The assessment of body image investment: An extensive revision of the appearance schemas inventory. *International Journal of Eating Disorders, 35*, 305-316.

Cash, T.F. & Strachan, M.D. (2004). Cognitive-behavioral approaches to changing body image. In: T.F. Cash & T. Pruzinsky (Eds.), *Body image: A handbook of theory, research, & clinical practice* (pp. 478-487). New York: The Guilford Press.

Crowther, J. H., Lilly, R.S., Crawford, P.A., & Shepherd, K.L. (1992). The stability of the Eating Disorder Inventory. *International Journal of Eating Disorders, 12*(1), 97-101.

Cusumano, D.L. & Thompson, J.K. (1997). Body image and body shape ideals in magazines: Exposure, awareness and internalization. *Sex Roles, 37*, 701-721.

Davis, R. (1993). *Development of the Concerns for Shape and Weight Scale as a measure of body image*. Unpublished manuscript, University of Toronto, Department of Psychiatry. Toronto, Ontario, Canada.

Davis, R., McVey, G., Heinmann, M., Rockert, W., & Kennedy, S. (1999). Sequencing of cognitive-behavioural treatments for bulimia nervosa. *International Journal of Eating Disorders, 25*, 361-374.

Davis, R., McVey, G., Heinmaa, M., Stephens, D., Mercier, M., Degagne-White, K., Esposti, J. Bourret, K., Strudle, K., Heimonen, T., Lucier, M. K., & Crowther-Rakochy, W. (2004). *Turning points for teens: Ontario community-based treatment for adolescent eating disorders*. Funded by the Ontario Ministry of Health and Long-Term Care, 2004-2006.

Davis, R., Olmsted, M.P., & Rockert, W. (1990). Brief group psychoeducation for bulimia nervosa: assessing the clinical significance of change. *Journal of Consulting & Clinical Psychology*, *58*(6), 882-885.

Davis, R., Olmsted, M.P., & Rockert, W. (1990). Brief group psychoeducation for bulimia nervosa: II. Prediction of clinical outcome. *International Journal of Eating Disorders*, *11*(3), 205-211.

Davis, R., Olmsted, M., Rockert, W., Marques, T. & Dolhanty, J. (1997). Group psychoeducation for bulimia nervosa with and without additional psychotherapy process sessions. *International Journal of Eating Disorders*, *22*, 25-34.

Delinsky, S. S., & Wilson, G. T. (2006). Mirror exposure for the treatment of body image disturbance. *International Journal of Eating Disorders*, *39*(2), 108-116.

Dittmar, H., Halliwell, E., & Stirling, E. (2009). Understanding the impact of thin media models on women's body-focused affect: The roles of thin-ideal internalization and weight-related self-discrepancy activation in experimental exposure effects. *Journal of Social and Clinical Psychology*, *28*(1), 43-72.

Dohnt, H. K., & Tiggemann, M. (2005). Peer influences on body dissatisfaction and dieting awareness in young girls. *British Journal of Developmental Psychology*, *23*(1), 103-116.

Edlund, M., Wamg, P., Berflund, P.A., Katz, S. J., Lin, E., & Kessler, R.C. (2002). Dropping out of mental health treatment: Patterns and predictors among epidemiological survey respondents in the United States and Ontario, *American Journal of Psychiatry*, *159*(5), 845-851.

Ehlers, A., & Breuer, P. (1996). How good are patients with panic disorder at perceiving their heartbeats? *Biological Psychology*, *42*, 165-182.

Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, *16*(4), 363-370.

Farrell, C., Shafran, R., & Fairburn, C. G. (2004). Mirror cognitions & behaviours in people concerned about their body shape. *Behavioural and Cognitive Psychotherapy*, *32*(2), 225-229.

Feldman, G.C., Hays, A.M., Kumar, S.M., & Greesom, J.M. & Laureneau, J.P. (2004). Mindfulness and emotion regulation: The development and initial validation of the cognitive and affective mindfulness scale revised (CMAS-R). *Journal of Psychopathology and Behavioural Assessment*, *29*, 177-190.

Freeman, R. J., Thomas, C. D., Solyom, L., & Hunter, M. A. (1984). A modified video camera for measuring body image distortion: Technical description and reliability. *Psychological Medicine*, *14*(2), 411-416.

First M.B., Spitzer R.L., Gibbon M., & Williams J.B.W. (1997). *Structured Clinical Interview for* DSM-IV *Axis I Disorders, Research Version, Non-patient Edition (SCID-I/NP)*. New York: Biometrics Research, New York State Psychiatric Institute.

Frost, J. & McKelvie, S. (2004). Self-esteem and body satisfaction in male and female elementary school, high school, and university students. *Sex Roles*, *51*(1-2), 45-54.

Garner, D. M. (1991). *EDI-2 Eating Disorder Inventory-2 professional manual*. Los Angeles: Western Psychological Services.

Garner, D. M., Garfinkel, P. E., Schwartz, D., & Thompson, M. (1980). Cultural expectations of thinness in women. *Psychological Reports*, *47*(2), 483-491.

Grabe, S. & Hyde, J.S. (2006). Ethnicity and body dissatisfaction among women in the United States: A meta-analysis. *Psychological Bulletin*, *132*(4), 622-640.

Grant, J.R & Cash, T.F. (1995). Cognitive-behavioral body-image therapy: Comparative efficacy of group and modest-contact treatments. *Behavior Therapy*, *26*, 69-84.

Hargreaves, D., & Tiggemann, M. (2002). The effect of television commercials on mood and body dissatisfaction: The role of appearance-schema activation. *Journal of Social & Clinical Psychology*, *21*(3), 287-308.

Hayes, S. C., & Wilson, K. G. (2003). Mindfulness: Method & Process. *Clinical Psychology: Science & Practice, 10*, 161-165.

Hilbert, A., Tuschen-Caffier, B., (2004). Body image interventions in cognitive-behavioural therapy of binge-eating disorder: a component analysis. *Behavior Research and Therapy*, *42*, 1325-1339.

Hilbert, A. & Tuschen-Caffier, B., & Vögele, C. (2002). Effects of prolonged and repeated body image exposure in binge-eating disorder. *Journal of Psychosomatic Research*, *52*(3), 137-144.

Hollis, S. & Campbell, F. (1999). What is meant by intention to treat analysis? Survey of published randomised controlled trials. *British Medical Journal*, *319*, 670-674.

Ip, K. & Jarry, J.L. (2007). Investment in body image for self-definition results in greater vulnerability to the thin media than does investment in appearance management. *Body Image*, *5*, 59-69.

Jarry, J.L. & Berardi, K. (2004) Characteristics and effectiveness of stand-alone body image treatments: a review of the empirical literature. *Body Image*, *1*, 319-333.

Jarry, J.L. & Ip, K. (2005). The effectiveness of stand-alone cognitive behavioural therapy for body image: A meta-analysis. *Body Image*, *2*, 317-331.

Johnson, F., & Wardle, J. (2005). Dietary restraint, body dissatisfaction, and psychological distress: A prospective analysis. *Journal of Abnormal Psychology*, *114*(1), 119-125.

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, *4*, 33-47.

Kabat-Zinn, J. (Speaker). (1995). *Mindfulness meditation: Cultivating the wisdom of your body and mind* (Compact Disc Recording). New York: Simon & Schuster Audio.

Kabat-Zinn, J., Lipsorth, L., & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine*, *8*(2), 163-190.

Kabat-Zinn, J., Massion, A., Kristeller, J., & Peterson, L. (1992). Effectiveness of a meditation based stress reduction program in the treatment of anxiety disorders. *American Journal of Psychiatry*, *149*, 936-943.

Kabat-Zinn, J., Wheeler, E., Light, T, Skillings, Z., Scharf, M. J., Cropley, T.G., Hosmer, D., & Bernhard, J. D. (1998). Influence of a mindfulness meditation based stress reduction intervention on rates on skin clearing in patients. *Psychosomatic Medicine*, *60*, 625-632.

Kaplan, K., Goldenberg, D., & Galvin-Nadeau, M. (1993). The impact of a meditation based stress reduction program on fibromyalgia. *General Hospital Psychiatry, 15*, 284-289.

Keel, P. K., Mitchell, J. E., Davis, T. L., & Crow, S. J. (2001). Relationship between depression and body dissatisfaction in women diagnosed with bulimia nervosa. *International Journal of Eating Disorders, 30*(1), 48-56.

Keery, H., van den Berg, P., & Thompson, J. K. (2004). An evaluation of the tripartite influence model of body dissatisfaction and eating disturbance with adolescent girls. *Body Image, 1*(3), 237-251.

Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S.-L.T., Walters, E.E., & Zaslavsky, A. (2002). Short screening scales to monitor population prevalances and trends in nonspecific psychological distress. *Psychological Medicine. 32*(6), 959-976.

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., Howes, M. J., Normand, S-L. T., Manderscheid, R. W., Walters, E. E., & Zaslavsky, A. M. (2003) Screening for serious mental illness in the general population. *Archives of General Psychiatry, 60*, 184-189.

Killen, J. D., Taylor, C. B., Hayward, C., Haydel, K. F., & et al. (1996). Weight concerns influence the development of eating disorders: A 4-year prospective study. *Journal of Consulting and Clinical Psychology, 64*(5), 936-940.

Kristeller, J. L. & Hallett, C. B. (1999). An exploratory study of a meditation-based intervention for binge eating disorder. *Journal of Health Psychology, 4*, 357-363.

Krones, P. G., Stice, E., Batres, C., & Orjada, K. (2005). In vivo social comparison to a thin-ideal peer promotes body dissatisfaction: A randomized experiment. *International Journal of Eating Disorders*, *38*(2), 134-142.

Langer, E.J. & Moldoveanu, M. (2000). The construct of mindfulness. *Journal of Social Issues*, *56*(1), 1-9.

Lau, M.A., Bishop, S.R., Segal, Z.V., Buis, T., Anderson, N.D., Carlson, L. et al. (2006). The Toronto mindfulness scale: Development and validation. *Journal of Clinical Psychology*, *62*(12), 1445-1467.

Leahey, T.M., Crowther, J.H., & Irwin, S.R. (2008). A cognitive-behavioural mindfulness group therapy intervention for the treatment of binge eating in bariatric surgary patients. *Cognitive and Behavioral Practice, 15*(4), 364-375.

Levine, M.P. & Smolak, L. (2006). *The prevention of eating problems and eating disorders: Theory, research, and practice*. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Michalak, J., Heidenreichm, P., Meibert, T., & Schulte, D. (2008). Mindfulness predicts relapse/recurrence in major depressive disorder after mindfulness-based cognitive therapy. *Journal of Nervous and Mental Disease*, *196* (8), 630-633.

Mond, J.M., Hay, P.J., Rodgers, P., Owen, C., & Beumont, P.J.V. (2004). Validity of the Eating Disorder Examination Questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behaviour Research and Therapy*, *42*(5), 551-567.

Neighbors, L.A. & Sobal, J. (2007). Prevalence and mangnitude of body weight and shape dissatisfaction among university students. *Eating Behaviors*, *8*, 429-439.

Noles, S. W., Cash, T. F., & Winstead, B. A. (1985). Body image, physical attractiveness, and depression. *Journal of Consulting and Clinical Psychology*, *53*(1), 88-94.

Probst, M., Vandereycken, W., van Coppenolle, H., & Pieters, G. (1995). Body size estimation in eating disorder patients: Testing the video distortion method on a life-size screen. *Behaviour Research and Therapy*, *33*(8), 985-990.

Prusinsky, T. & Cash, T.F. (2004). Understanding body images: Historical and contemporary perspectives. In: T.F. Cash & T. Pruzinsky (Eds.), *Body image: A handbook of theory, research, & clinical practice* (pp. 3-12). New York: The Guilford Press.

Ramel, W, Goldin, P.R., Carmona, P.E., & McQuaid, J.R. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive Therapy and Research*, *28*(4), 433-455.

Reas, D. L., Grilo, C. M., Masheb, R. M., & Wilson, G. T. (2005). Body checking and avoidance in overweight patients with binge eating disorder. *International Journal of Eating Disorders*, *37*(4), 342-346.

Reas, D. L., Whisenhunt, B. L., Netemeyer, R., & Williamson, D. A. (2002). Development of the body checking questionnaire: A self-report measure of body checking behaviors. *International Journal of Eating Disorders*, *31*(3), 324-333.

Riendeau, J. A. M. (2007). *Psychological responses to three dimensional body shape exposure in female university students*. (Unpublished master's thesis). Lakehead University, Thunder Bay, Ontario.

Riva, G. (1998). Modifications of body image induced by virtual reality. *Perceptual and Motor Skills, 86,* 163-170.

Roemer, L., & Orsillo, S. M. (2003). Mindfulness: A promising intervention strategy in need of further study. *Clinical Psychology: Science & Practice*, *10*, 172-178.

Rosen, J. C., Cado, S., Silberg, N. T., & Srebnik, D., (1990). Cognitive behavior therapy with and without size perception training for women with body image disturbance. *Behavior Therapy*, *21*(4), 481-498.

Rosen, J. C., Srebnik, D., Saltzberg, E., & Wendt, S. (1991). Development of a body image avoidance questionnaire. *Psychological Assessment*, *3*(1), 32-37.

Rosenberg, M. (1989). *Society and the adolescent self-image*. Revised edition. Middletown, CT: Wesleyan University Press.

Safran, J. D., & Segal, Z. V. (1990). *Interpersonal process in cognitive therapy*. New York: Basic Books.

Segal, V., Williams, M., & Teasdale, J. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: The Guilford Press.

Shafran, R. & Fairburn, C. G. (2002). A new ecologically valid method to assess body size estimation and body size dissatisfaction. *International Journal of Eating Disorders*, *32*(4), 458-465.

Shafran, R., Fairburn, C., Robinson, P., & Lask, B. (2004). Body Checking and its Avoidance in Eating Disorders. *International Journal of Eating Disorders*, *35*(1), 93-101.

Shafran, R., Lee, M., Payne, E. & Fairburn, C. (2007). An experimental analysis of body checking. *Behaviour Research and Therapy*, *45*(1), 113-121.

Silber, E., & Tippett, J.S. (1965). Self-esteem: Clinical assessment and measurement validation. *Psychological Reports*, *16*, 1017-1071.

Slade, P.D. & Russell, G.F.M. (1973). Awareness of body dimensions in anorexia nervosa: Cross-sectional and longitudinal designs, *Psychological Medicine*, *3*, 188-199.

Smith, E., & Rieger, E. (2006). The effect of attentional bias toward shape- and weight-related information on body dissatisfaction. *International Journal of Eating Disorders*, *39*(6), 509-515.

Speca, M., Carlson, L. E., Goodey, E., & Angen, M. (2000). A randomized, wait-list controlled clinical trial: The effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosomatic Medicine*, *62*, 613-622.

Spillane, N.S., Boerner, L.M., Andersen, K.G. & Smith, G.T. (2004) Comparability of the Eating Disorder Inventory-2 between women and men. *Assessment*, *11*(1), 85-93.

Stewart, T.M. (2004). Light on body image treatment: Acceptance through mindfulness. *Behavior Modification*, *28*(6), 783-811.

Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta- analytic review. *Psychological Bulletin*, *128*(5), 825-848.

Stice, E., & Agras, W. S. (1998). Predicting onset and cessation of bulimic behaviors during adolescence: A longitudinal grouping analysis. *Behavior Therapy*, *29*(2), 257-276.

Stice, E., & Bearman, S. K. (2001). Body-image and eating disturbances prospectively predict increases in depressive symptoms in adolescent girls: A growth curve analysis. *Developmental Psychology, 37*(5), 597-607.

Stice, E., Hayward, C., Cameron, R. P., Killen, J. D., & Taylor, C. B. (2000). Body-image and eating disturbances predict onset of depression among female adolescents: A longitudinal study. *Journal of Abnormal Psychology, 109*(3), 438-444.

Stice, E., & Shaw, H. E. (2002). Role of body dissatisfaction in the onset and maintenance of eating pathology: A synthesis of research findings. *Journal of Psychosomatic Research, 53*(5), 985-993.

Strachan, M. & Cash, T. (2002). Self-help for a negative body image: A comparison of components of a cognitive-behavioural program. *Behavior Therapy, 33*, 235-251.

Suto, M. (2006). Stereophoto Maker (Version 3.10) [Computer software]. Japan.

Sypeck, M.F., Gray, J.J., Etu, S., Ahrens, A.H., Mosimann, J.E., & Wiseman, C.V. (2006). Cultural representations of thinness in women, redux: Playboy magazine's depiction of beauty from 1979 to 1999. *Body Image, 3(*3), 229-235.

Tabachnick, B.G. & Fidell, L.S. (2007). *Using multivariate statistics* (5th Ed.). Boston: Pearson.

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology, 68*, 615–623.

Thompson, J.K. & Dolce, J.J. (1989). The discrepancy between emotional versus rational estimates of body size, actual size and ideal body ratings. *Journal of Clinical Psychology, 45*, 473-478.

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance.* Washington, DC:

Thompson, J.K. & Spana, R.E. (1988). The adjustable light beam method for the assessment of size estmation accuracy description, psychometrics, and normative data. *International Journal of Eating Disorders, 7*, 521-526.

Thompson, J.K. & Stice, E. (2001). Thin-ideal internalization: Mounting evidence for a new risk factor for body-image disturbance and eating pathology, *Current Directions in Psychological Science. 10*(5), 181-183.

Thompson, J.K. & van den Berg, P. (2004). Measuring body image attitides among adolescents and adults. IN: T.F. Cash & T. Pruzinsky (Eds.). *Body image: A handbook of theory and practice* (pp. 142-154). New York: The Guilford Press.

Tiggemann, M. (2004). Media influences on body image development. IN: T.F. Cash & T. Pruzinsky (Eds.). *Body image: A handbook of theory and practice* (pp. 91-98). New York: The Guilford Press.

Tiggemann, M. (2005). Body dissatisfaction and adolescent self-esteem: Prospective findings. *Body Image, 2*, 129-135.

Tuschen-Caffier, B, Vogele, C., Bracht, S. & Hilbert, A. (2003). Psychologicacl responses to body shape exposure in patients with bulimia nervosa. *Behaviour Research and Therapy, 41*(5), 573-586.

van Strien, T., Frijters, J. E., van Staveren, W. A., Defares, P. B., & Deurenberg, P. (1986). The predictive validity of the Dutch Restrained eating Scale. *International Journal of Eating Disorders*, *5*, 747-755.

Wade, J.T. & Cooper, M. (1999). Sex differences in the links between attractiveness, self-esteem and the body. *Personality and Individual Differences*, *27*(6), 1047-1056.

Watson, D., & Clark, L. A. (1994). *The PANAS-X: Manual for the Positive and Negative Affect Schedule*, University of Iowa.

Williamson, D., Muller, S.L., Reas, D.L., & Thaw, J.M (1999). Cognitive bias in eating disorders: Implications for theory and treatment. *Behaviour Modification*, *23*(4), 556-577.

Winzelberg, A.J., Abascal, L., & Taylor, C.B. (2004). Psychoeducational approaches to the prevention and change of negative body image. IN: T.F. Cash & T. Pruzinsky (Eds.). *Body image: A handbook of theory and practice* (pp. 487-496). New York: The Guilford Press.

Wiseman, C. V., Gray, J. J., Mosimann, J. E., & Ahrens, A. H. (1992). Cultural expectations of thinness in women: An update. *International Journal of Eating Disorders*, *11*(1), 85-89.

Appendix A

Concerns for Shape and Weight Scale

CSAW

This is a scale that measures a variety of personal opinions and feelings about your own body weight and shape. THERE ARE NO RIGHT OR WRONG ANSWERS SO TRY VERY HARD TO BE COMPLETELY HONEST IN YOUR ANSWERS. Read each statement carefully. For each statement circle the abbreviation that **best represents your opinion or feeling.**

SD = Strongly Disagree; **D** = Disagree; **N** = Neutral; **A** = Agree; **SA** = Strongly Agree

1	I think a lot about my weight or shape.	SD	D	N	A	SA
2	I think that being at the right weight or shape leads to greater happiness in my relationships with other people my age.	SD	D	N	A	SA
3	I think that changing my weight or shape are not high priorities at this point in my life.	SD	D	N	A	SA
4	I think that changing my weight or shape is just about the only way I could feel better about myself at this point.	SD	D	N	A	SA
5	I think the happiest moments in my life were mainly due to the fact that I was at the right weight or shape back then.	SD	D	N	A	SA
6	I think I would rather be successful in my work or studies than be successful in achieving and maintaining the right weight or shape.	SD	D	N	A	SA
7	I think that my weight or shape will have little or no influence on the direction that my life takes in the future.	SD	D	N	A	SA
8	I think that getting to the right weight or shape makes me a more special person.	SD	D	N	A	SA
9	I think my desire to change my weight or shape is more important than just about anything else in my life at the moment.	SD	D	N	A	SA
10	I think that my life would be much better if I were at the right weight or shape.	SD	D	N	A	SA
11	I think that my weight or shape will have little or no influence on my ability to achieve the future goals that I have set for myself.	SD	D	N	A	SA
12	I think that I worry a lot about my weight or shape.	SD	D	N	A	SA
13	I think that many of the problems I face right now are caused by not being at the right weight or shape.	SD	D	N	A	SA
14	I think that little else could make me happier than achieving or maintaining the right shape or weight.	SD	D	N	A	SA
15	I think that my weight or shape do not greatly influence the way I feel about myself as a person.	SD	D	N	A	SA
16	I think that many of my personal problems would be solved if I could only get to the right weight or shape.	SD	D	N	A	SA
17	I think that my weight or shape are not the most important parts of my identity.	SD	D	N	A	SA
18	I think that my own worth as a person is mainly determined by my weight or shape.	SD	D	N	A	SA

19	I think that the good things I have experienced so far have had little to do with my weight or shape.	SD	D	N	A	SA
20	I think that my main problem right now is my inability to achieve and maintain the right weight or shape.	SD	D	N	A	SA
21	I think that other people my age don't really care about my weight or shape.	SD	D	N	A	SA
22	I think that I would become a more valuable person if I were able to achieve or maintain the right weight or shape.	SD	D	N	A	SA
23	I feel insecure about my weight or shape.	SD	D	N	A	SA
24	I feel great about my weight or shape.	SD	D	N	A	SA
25	I feel negative about my weight or shape.	SD	D	N	A	SA
26	I feel humiliated about my weight or shape.	SD	D	N	A	SA
27	I feel unhappy about my weight or shape.	SD	D	N	A	SA
28	I feel comfortable about my weight or shape.	SD	D	N	A	SA
29	I feel dissatisfied about my weight or shape.	SD	D	N	A	SA
30	I feel secure about my weight or shape.	SD	D	N	A	SA
31	I feel terrible about my weight or shape.	SD	D	N	A	SA
32	I feel proud about my weight or shape.	SD	D	N	A	SA
33	I feel bad about my weight or shape.	SD	D	N	A	SA
34	I feel happy about my weight or shape.	SD	D	N	A	SA
35	I feel satisfied about my weight or shape.	SD	D	N	A	SA
36	I feel nervous about my weight or shape.	SD	D	N	A	SA
37	I feel uncomfortable about my weight or shape.	SD	D	N	A	SA
38	I feel relaxed about my weight or shape.	SD	D	N	A	SA
39	I feel good about my weight or shape.F	SD	D	N	A	SA

40	I feel positive about my weight or shape.	SD	D	N	A	SA

Appendix B

Eating Disorder Inventory-2-Body Dissatisfaction

EDI-2-BD

Please indicate which rating best applies to you by circling the response:

A = Always; **U** = Usually; **O** = Often; **S** = Sometimes; **R** = Rarely; **N** = Never

1	I think that my stomach is too big	A	U	O	S	R	N
2	I think that my thighs are too large	A	U	O	S	R	N
3	I think that my stomach is just the right size	A	U	O	S	R	N
4	I feel satisfied with the shape of my body	A	U	O	S	R	N
5	I like the shape of my buttocks	A	U	O	S	R	N
6	I think my hips are too big	A	U	O	S	R	N
7	I think that my thighs are just the right size	A	U	O	S	R	N
8	I think that my buttocks are too large	A	U	O	S	R	N
9	I think my hips are just the right size	A	U	O	S	R	N

Appendix C

Body Checking Questionnaire

Body Checking Questionnaire

Please select the circle which best describes how often you engage in these behaviours at the present time.

I check to see if my thighs spread when I'm sitting down.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I pinch my stomach to measure fatness.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I have special clothes which I try on to see if they still fit.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I check the diameter of my wrist to make sure that it's the same size as before.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I check my reflection in glass doors	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I pinch my upper arms to measure fatness.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I touch underneath my chin to make sure that I don't have a double chin.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I look at others to see how my body size compares to their body size.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I rub (or touch) my thighs while sitting to check for fatness.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I check the diameter of my legs to make sure that they're the same as before.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I ask others about their weight or clothing size so that I can compare my own weight/size.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I check to see how my bottom looks in the mirror.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I practice sitting and standing in various positions to see how I would look in each position.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I check to see if my thighs rub together.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I try to elicit comments from others	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I check to see if my fat jiggles.	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5
I suck in my gut to see what it is like when my stomach is	*Never* 1	*Rarely* 2	*Sometimes* 3	*Often* 4	*Very Often* 5

completely flat.

I check to make sure that my rings fit the same way that they did before.	*Never* *1*	*Rarely* *2*	*Sometimes* *3*	*Often* *4*	*Very Often* *5*
I look to see if I have cellulite in my thighs when I am sitting.	*Never* *1*	*Rarely* *2*	*Sometimes* *3*	*Often* *4*	*Very Often* *5*
I lie down on the floor to see if I can feel my bones touch the floor.	*Never* *1*	*Rarely* *2*	*Sometimes* *3*	*Often* *4*	*Very Often* *5*
I pull my clothes as tightly as possible around myself to see how I look.	*Never* *1*	*Rarely* *2*	*Sometimes* *3*	*Often* *4*	*Very Often* *5*
I compare myself to models on TV or in magazines.	*Never* *1*	*Rarely* *2*	*Sometimes* *3*	*Often* *4*	*Very Often* *5*
I pinch my cheeks to measure fatness	*Never* *1*	*Rarely* *2*	*Sometimes* *3*	*Often* *4*	*Very Often* *5*

Appendix D

Body Image Avoidance Questionnaire

Circle the number which best describes how often you engage in these behaviors at the present time.

	Always	Usually	Often	Sometimes	Rarely	Never
I wear baggy clothes	5	4	3	2	1	0
I wear clothes I do not like	5	4	3	2	1	0
1 wear darker color clothing	5	4	3	2	1	0
1 wear a special set of clothing, e.g., my "fat clothes"	5	4	3	2	1	0
I restrict the amount of food I eat	5	4	3	2	1	0
I only eat fruits, vegetables and other low calorie foods	5	4	3	2	1	0
I fast for a day or longer	5	4	3	2	1	0
1 do not go out socially if I will be "checked out"	5	4	3	2	1	0
I do not go out socially if the people I am with will discuss weight	5	4	3	2	1	0
I do not go out socially if the people I am with are thinner than me	5	4	3	2	1	0
I do not go out socially if it involves eating	5	4	3	2	1	0
I weigh myself	5	4	3	2	1	0
I am inactive	5	4	3	2	1	0
I look at myself in the mirror	5	4	3	2	1	0
I avoid physical intimacy	5	4	3	2	1	0
I wear clothes that will divert attention from my weight	5	4	3	2	1	0
I avoid going clothes shopping	5	4	3	2	1	0
I don't wear "revealing" clothes (e.g., bathing suits, tank tops, or shorts)	5	4	3	2	1	0
I get dressed up or made up	5	4	3	2	1	0

Appendix E

Eating Disorder Examination-Questionnaire

EDE-Q

The following questions are concerned with the **PAST FOUR WEEKS ONLY** (28 DAYS). Please read each question carefully and circle the number on the right. Please answer **ALL** the questions.

EXAMPLES: **ON HOW MANY DAYS OUT OF THE PAST 28 DAYS.....**	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
...Have you tried to eat vegetables?	0	1	2	(3)	4	5	6
...How many times have you walked to school?	0	1	(2)	3	4	5	6

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS.....	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1. ...Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?	0	1	2	3	4	5	6
2. ...Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?	0	1	2	3	4	5	6
3. ...Have you tried to avoid eating any foods which you like in order to influence your shape or weight?	0	1	2	3	4	5	6
4. ...Have you ever tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	0	1	2	3	4	5	6

5. …Have you wanted your stomach to be empty?	0	1	2	3	4	5	6
6. …Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
7. …Have you been afraid of losing control over your eating?	0	1	2	3	4	5	6
8. …Have you had episodes of binge eating?	0	1	2	3	4	5	6

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS…..	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
9. …Have you eaten in secret? (Do not count binges.)	0	1	2	3	4	5	6
10. …Have you definitely wanted your stomach to be flat?	0	1	2	3	4	5	6
11. …Has thinking about shape or weight made it more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
12. …Have you had a definite fear that you might gain weight or become fat?	0	1	2	3	4	5	6
13. …Have you felt fat?	0	1	2	3	4	5	6
14. …Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

OVER THE PAST FOUR WEEKS (28 DAYS).....

15. ...On what proportion of times that you have eaten have you felt guilty because the effect on your shape or weight? (Do not count binges.) (Circle the number which applies.)

0. None of the times
1. A few of the times
2. Less than half the times
3. Half the times
4. More than half the times
5. Most of the times
6. Every time

16. ... Over the past four weeks (28 days), have there been any times when you have eaten what other people would regard as an unusually large amount of food given the circumstances? (Please circle appropriate number). **0- NO 1- YES**

17. ...How many such episodes have you had over the past four weeks? (Please write the appropriate number.)

18. ....During how many of these episodes of overeating did you have a sense of having lost control?

19. ....Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances? **0- NO 1- YES**

20. ... How many such episodes have you had over the past four weeks?

21. ....Over the past four weeks have you made yourself sick (vomit) as a means of controlling your shape or weight? **0- NO 1- YES**

22. ....How many times have you done this over the past four weeks?

23. ....Have you taken laxatives as a means of controlling your shape or weight? **0 -- NO 1 -- YES**

24. ....How many times have you done this over the past four weeks? _____

25. ....Have you taken diuretics (water tablets) as a means of controlling your shape or weight? **0 -- NO 1 -- YES**

26. ....How many times have you done this over the past four weeks? _____

27. ....Have you exercised hard as a means of controlling your shape or weight? **0 -- NO 1 -- YES**

28. ....How many times have you done this over the past four weeks? _____

OVER THE PAST FOUR WEEKS (28 DAYS).....
(Please circle the number which best describes your behaviour)

	NOT AT ALL		SLIGHTLY		MODERATELY		MARKEDLY
29. ....Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
30. ....Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
31. ....How much would it upset you if you had to weigh yourself once a week for the next four weeks?	0	1	2	3	4	5	6
32. ....How dissatisfied have you felt about your weight?	0	1	2	3	4	5	6
33. ....How dissatisfied have you felt about your shape?	0	1	2	3	4	5	6
34. ....How concerned have you been about other people seeing you eat?	0	1	2	3	4	5	6

OVER THE PAST FOUR WEEKS (28 DAYS).....
(Please circle the number which best describes your behaviour)

	NOT AT ALL		SLIGHTLY		MODERATELY		MARKEDLY
35 ....How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or shower?	0	1	2	3	4	5	6
36....How uncomfortable have you felt about others seeing your body; for example, in shared changing rooms, when swimming or wearing tight clothes?	0	1	2	3	4	5	6

37. How much do you weigh? If uncertain please give your best estimate. _____ lb.

38. How much would you like to weigh? _____lb.

39. How tall are you? If uncertain please give your best estimate. ____ ft ____ in.

40. Over the past 3 months, how many menstrual periods have you missed?

0 1 2 3 na

41. Have you been taking birth control pills during the past 3 months? YES NO

Appendix F

Rosenberg Self-Esteem Scale

RSE

Please circle the appropriate answer per item. Use the following scale:

1 = Strongly Agree; **2** = Agree; **3** = Disagree; **4** = Strongly Disagree

1	On the whole, I am satisfied with myself.	1	2	3	4
2	At times I think I am no good at all.	1	2	3	4
3	I feel that I have a number of good qualities.	1	2	3	4
4	I am able to do things as well as most other people.	1	2	3	4
5	I feel I do not have much to be proud of.	1	2	3	4
6	I certainly feel useless at times.	1	2	3	4
7	I feel that I'm a person of worth, at least on an equal plane as others.	1	2	3	4
8	I wish I could have more respect for myself.	1	2	3	4
9	All in all, I am inclined to feel that I am a failure.	1	2	3	4
10	I take a positive attitude toward myself.	1	2	3	4

Appendix G

Kessler 6-Item Psychological Distress Scale

Q2. The last six questions asked about feelings that might have occurred during the past 30 days. Taking them altogether, did these feelings occur More often in the past 30 days

The following questions ask about how you have been feeling during the **past 30 days**. For each question, please circle the number that best describes how often you had this feeling.

Q1.	**During the past 30 days, about how often did you feel ...**	**All of the time**	**Most of the time**	**Some of the time**	**A little of the time**	**None of the time**
a.	...nervous?	**4**	**3**	**2**	**1**	**0**
b.	...hopeless?	**4**	**3**	**2**	**1**	**0**
c.	...restless or fidgety?	**4**	**3**	**2**	**1**	**0**
d.	...so depressed that nothing could cheer you up?	**4**	**3**	**2**	**1**	**0**
e.	...that everything was an effort?	**4**	**3**	**2**	**1**	**0**
f.	...worthless?	**4**	**3**	**2**	**1**	**0**

than is usual for you, about the same as usual, or less often than usual? (If you never have any of these feelings, circle response option "4.")

More often than usual			**About the same as usual**	**Less often than usual**		
1	**2**	**3**	**4**	**5**	**6**	**7**

The next few questions are about how these feelings may have affected you in the past 30 days. You need not answer these questions if you answered "None of the time" to **all** of the six questions about your feelings.

Q3. During the past 30 days, how many days out of 30 were you totally unable to work or carry out your normal activities because of these feelings?

_____**(Number of days)**

Q4. Not counting the days you reported in response to Q3, how many days in the past 30 were you able to do only half or less of what you would normally have been able to do, because of these feelings?

_____ **(Number of days)**

Q5. During the past 30 days, how many times did you see a doctor or other health professional about these feelings?

_____**(Number of times)**

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	1	2	3	4	5
Q6. During the past 30 days, how often have physical health problems been the main cause of these feelings?					

Appendix H

Positive and Negative Affect Schedule

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way in the past few weeks. Please indicate which rating best applies to you by circling the response:

1 = Very slightly or not at all; 2 = A little; 3 = Moderately; 4 = Quite a bit; 5 = Extremely

Scared	1	2	3	4	5
Nervous	1	2	3	4	5
Jittery	1	2	3	4	5
Irritable	1	2	3	4	5
Hostile	1	2	3	4	5
Afraid	1	2	3	4	5
Guilty	1	2	3	4	5
Ashamed	1	2	3	4	5
Attentive	1	2	3	4	5
Interested	1	2	3	4	5
Alert	1	2	3	4	5
Excited	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Inspired	1	2	3	4	5
Proud	1	2	3	4	5
Upset	1	2	3	4	5
Distressed	1	2	3	4	5
Determined	1	2	3	4	5
Strong	1	2	3	4	5
Active	1	2	3	4	5

Appendix I

Dutch Restrained Eating Scale

DRES

Please indicate which rating best applies to you by circling the response:

1 = Never; **2** = Rarely; **3** = Sometimes; **4** = Often; **5** = Very Often

1 When you have put on weight do you eat less than you usually do?	1	2	3	4	5
2 Do you try to eat less at mealtimes than you would like to eat?	1	2	3	4	5
3 How often do you refuse food or drink offered you because you are concerned about your weight?	1	2	3	4	5
4 Do you watch exactly what you eat?	1	2	3	4	5
5 Do you deliberately eat foods that are slimming?	1	2	3	4	5
6 When you have eaten too much, do you eat less than usual the following day?	1	2	3	4	5
7 Do you deliberately eat less in order not to become heavier?	1	2	3	4	5
8 How often do you try not to eat between meals because you are watching your weight?	1	2	3	4	5
9 How often in the evenings do you try not to eat because you are watching your weight?	1	2	3	4	5
10 Do you take your weight into account with what you eat?	1	2	3	4	5

Appendix J

Philadelphia Mindfulness Scale

PHLMS

Instructions: Please circle how often you experienced each of the following statements *within the past week.*

1. I am aware of what thoughts are passing through my mind.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

2. I try to distract myself when I feel unpleasant emotions.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

3. When talking with other people, I am aware of their facial and body expressions

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

4. There are aspects of myself I don't want to think about

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

5. When I shower, I am aware of how the water is running over my body.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

6. I try to stay busy to keep thoughts or feelings from coming to mind.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

7. When I am startled, I notice what is going on inside my body.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

8. I wish I could control my emotions more easily.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

9. When I walk outside, I am aware of smells or how the air feels against my face.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

10. I tell myself that I shouldn't have certain thoughts.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

11. When someone asks how I am feeling, I can identify my emotions easily.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

12. There are things I try not to think about.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

13. I am aware of thoughts I'm having when my mood changes.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

1. I tell myself that I shouldn't feel sad.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

15. I notice changes inside my body, like my heart beating faster or my muscles getting tense.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

16. If there is something I don't want to think about, I'll try many things to get it out of my mind.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

17. Whenever my emotions change, I am conscious of them immediately.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

18. I try to put my problems out of mind.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

19. When talking with other people, I am aware of the emotions I am experiencing.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

20. When I have a bad memory, I try to distract myself to make it go away.

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*
1	*2*	*3*	*4*	*5*

Appendix K

Toronto Mindfulness Scale

Toronto Mindfulness Scale

Instructions: We are interested in what you just experienced. Below is a list of things that people sometimes experience. Please read each statement. Next to each statement are five choices: "not at all", "a little", "moderately", "quite a bit" and "very much". Please indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, just now?	**Not at all**	**A little**	**Moderately**	**Quite a bit**	**Very much**
1. I experienced myself as separate from my changing thoughts and feelings.	0	1	2	3	4
2. I was more concerned with being open to my experiences than controlling or changing them.	0	1	2	3	4
3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings	0	1	2	3	4
4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things	0	1	2	3	4
5. I was curious to see what my mind was up to from moment to moment.	0	1	2	3	4
6. I was curious about each of the thoughts and feelings that I was having.	0	1	2	3	4
7. I was receptive to observing unpleasant thoughts and feelings without interfering with them.	0	1	2	3	4
8. I was more invested in just watching my experiences as they arose, than in figuring out what they could mean.	0	1	2	3	4
9. I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant.	0	1	2	3	4
10. I remained curious about the nature of each experience as it arose.	0	1	2	3	4
11. I was aware of my thoughts and feelings without over-identifying with them.	0	1	2	3	4
12. I was curious about my reactions to things.	0	1	2	3	4
13. I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to.	0	1	2	3	4

Appendix L

Initial Email

Dear Participant,

Recently you completed a survey investigating facets of body image and eating behaviours. You expressed interest in learning about a program, which can help improve your body image. With the end of the school year I have received a number of email asking if it is too late for participation. It is not too late and I thought I'd send an email to address anyone else curious if they can still participate.

The entire program will require one meeting (with just myself or a research assistant (i.e., not a group meeting) at LU, as well as approximately 25 minutes of your time in your own home for 14 days. The 25 minutes daily require only yourself and a computer with internet access. This program is designed to be super flexible to your personal schedule. During the two weeks of your participation you will learn skills, which can help you feel better and think about yourself and your body. At the end you will be asked to complete the online questionnaire at the end and have an opportunity (but certainly don't have to) meet with me again for feedback on your experience. Of course, you will be free to withdraw your participation at any time during the study.

If you would like to participate in this program please reply to this email indicating your interest as well as any questions you may have. For example, if you are worried that you may not have time let me know and we can see if we can work something out for you. Also, if you plan to leave town this spring, as long as you attend the first meeting with me to explain the study and such, you can participate in your home town or wherever its easiest for you. You are also most welcome to call me, Mandy at xxx-xxxx, anytime if you have questions. If you prefer not to take part in the study please also reply and indicate that you do not wish to participate and we will remove you name from our participant list.

I look forward to hearing from, and hopefully working out a program that will work for you. Thank you again,

Sincerely,

Mandy McMahan, MA
Ph.D. Candidate (Clinical Psychology)
Department of Psychology
Email:
Phone: xxx-xxxx

Appendix M

Participant Information Letter and Consent Form (Main Study- MPE)

PARTICIPANT CONSENT FORM

Mindfulness Practice for Body Image

Dear Participant:

Thank you for taking part in this research project regarding body image improvement.

During this study you will be asked to take part in a daily mindfulness practice exercise while viewing your 3Dimensional image on a computer screen. The mindfulness practice exercise is instructed through an audio commentary exercise. This study requires a 1.5 hour introduction and instruction appointment as well as 25 minutes per day in your own home. For your participation you will receive an additional Introduction to Psychology bonus point (if applicable) and your name will be entered into a $50 prize draw.

This research project is being conducted under the supervision of Dr. Ron Davis and has been approved by the Lakehead University Senate Research Ethics Board. Only Dr. Davis, one research associate, and I will have access to the information you provide. Your responses will not be identified by your name. When the study is completed, the information will be securely stored at Lakehead University for seven years. A report of findings will be available to those interested upon request.

Participation in this research study is completely voluntary and you can withdraw at any time from the study without penalty whatsoever. I sincerely appreciate your cooperation.

Thank you,

Amanda McMahan
Doctoral Candidate (Clinical Psychology)
Department of Psychology, Lakehead University

Consent Form

My signature below indicates that I have read the attached information sheet and that I have had the opportunity to receive satisfactory answers from project personnel as to any questions that I might have about participation in this project.

Signing this form indicates that I understand and agree to the following:

1. I am a volunteer and can withdraw at any time from the project without penalty of any kind.

2. There are no expected risks associated with participation in this project.

3. The information I provide by way of my responses to questionnaires will remain confidential, and will be securely stored in the Department of Psychology at Lakehead University for 7 years.

4. I may receive a summary of the project, upon request, following its completion.

Name of Participant (please print)	Birthdate
Signature of Participant	Date
Email Address	Telephone number
Student number for bonus mark (if applicable)	Name of Psychology 1100 Professor and section number (if applicable)

Appendix N

Participant Information Letter and Consent Form (Main Study- TP2)

PARTICIPANT CONSENT FORM

Turning Points 2

Dear Participant:

Thank you for taking part in this research project regarding body image improvement.

The TP2 program is a series of 14 video segments. Each segment depicts a group of women engaging in discussions about healthy lifestyle choices regarding eating behaviours and attitudes, nutrition, body image, physical activity, mood regulation, and interpersonal relationships with romantic partners, peers, and parents.

For your participation, you are asked to watch one segment of TP2 each day, read the corresponding chapter in a manual, and complete a brief questionnaire asking you about your thoughts of the video segment. The completion of these daily exercises will take approximately 25 minutes per day.

This research project is being conducted under the supervision of Dr. Ron Davis and has been approved by the Lakehead University Senate Research Ethics Board. Only Dr. Davis, one research associate, and I will have access to the information you provide. Your responses will not be identified by your name. When the study is completed, the information will be securely stored at Lakehead University for seven years. A report of findings will be available to those interested upon request.

Participation in this research study is completely voluntary and you can withdraw at any time from the study without penalty whatsoever. I sincerely appreciate your cooperation.

Thank you,

Amanda McMahan
Doctoral Candidate (Clinical Psychology)
Department of Psychology, Lakehead University

Consent Form

My signature below indicates that I have read the attached information sheet and that I have had the opportunity to receive satisfactory answers from project personnel as to any questions that I might have about participation in this project.

Signing this form indicates that I understand and agree to the following:

1. I am a volunteer and can withdraw at any time from the project without penalty of any kind.

2. There are no expected risks associated with participation in this project.

3. The information I provide by way of my responses to questionnaires will remain confidential, and will be securely stored in the Department of Psychology at Lakehead University for 7 years.

4. I may receive a summary of the project, upon request, following its completion.

Name of Participant (please print)	Birthdate
Signature of Participant	Date
Email Address	Telephone number
Student number for bonus mark (if applicable)	Name of Psychology 1100 Professor and section number (if applicable)

Appendix O

Treatment Credibility and Expectancy Measure

1. Please indicate how credible this intervention is regarding its ability to help people feel less distress about their bodies on a scale from 0 (No credibility) to 100 (Maximum credibility). Credibility rating:_____

2. Please indicate your confidence that this intervention will help you with your body image on a scale from 0 (No confidence) to 100 (Maximum confidence).
Confidence rating: _____

Appendix P

Daily TP2 Questionnaire

We are interested in your experience with the Turning Points segment you just watched. Please note that there are no "right" or "wrong" answers. We are simply interested in your impressions of the program as it applies to you. Please rate your present emotional state on a scale of -50 to 50 with -50 being the most negative/unpleasant emotional state and +50 being the most positive/pleasant emotional state.

Which TP segment title did you watch today?
a. Introduction
b. Body Image
c. Body Image & Media
d. Body Image & Peers
e. Body & Mind
f. Eating Behaviour
g. Meet the Dietitian
h. Set Point
i. Physical Activity
j. Chillaxing
k. Relationship: Friends
l. Relationship: Romantic
m. Relationship: Family
n. Goodbye

How much of the segment did you watch?
a. All
b. Part
c. None, never got around to viewing it

With whom did you watch the segment?
a. Alone
b. A friend
c. Other (partner, family member, etc.)

Which of the following activities did you complete (indicate all that apply)?
a. Read the accompanying online chapter
b. Complete the chapter exercises (if applicable)
c. Followed an internet link provided in the chapter (if applicable)
d. Engaged in a discussion regarding the segment's topics with someone
e. Other

Next to each statement are five choices: "not at all", "a little", "moderately", "quite a bit" and "very much". Please indicate the extent to which you agree with each statement.

I found this TP2 segment interesting.
This TP2 segment lead me to me reconsider some of my opinions.
This TP2 segment helped me feel better about myself.

I found this TP2 segment to be relevant to my life.
I would recommend this TP2 segment to a friend/family member

Additional comments:
Please feel free to note additional thoughts regarding the TP2 segment you just watched.

Appendix Q

Correlations Among the Variables

Table Q

Correlations Among the Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
EDE-Q														
1. Restraint	-	.71	.69	.67	.50	.61	.57	.62	.61	.79	-.43	.39	-.19	.40
2. Eating Concern		-	.83	.81	.62	.71	.68	.71	.75	.69	-.59	.54	-.36	.53
3. Shape Concern	.71	.81	-	.93	.77	.76	.84	.76	.77	.75	-.61	.52	-.39	.50
4. Weight Concern	.94	.84	.94	-	.77	.78	.83	.74	.73	.73	-.57	.49	-.37	.48
5. EDI-2-BD	.73	.54	.73	.72	-	.64	.82	.63	.66	.58	-.53	.41	-.38	.37
CSAW														
6. Attitude	.72	.82	.73	.79	.63	-	.77	.70	.67	.64	-.61	.46	-.39	.48
7. Affect	.65	.73	.83	.84	.74	.80	-	.67	.70	.63	-.61	.44	-.43	.45
8. BCQ	.63	.69	.71	.94	.57	.67	.64	-	.67	.69	-.56	.52	-.32	.52
9. BIAQ	.74	.79	.82	.78	.68	.70	.74	.61	-	.66	-.57	.53	-.38	.48
10. DRES	.81	.71	.73	.69	.50	.65	.60	.71	.71	-	-.45	.38	-.24	-.32
11. RSE	-.63	-.68	-.72	-.69	-.60	-.72	-.71	-.64	-.62	-.57	-	-.70	.62	-.67
12. K6	.49	.68	.72	.67	.57	.51	.61	.65	.63	.52	-.70	-	-.49	.72
PANAS														
13. Positive Affect	-.37	-.68	-.45	-.50	-.44	-.52	-.49	-.47	-.37	-.25*	.72	-.48	-	-.32
14. Negative Affect	.61	.68	.65	.57	.50	.58	.60	.62	.63	.54	-.67	.73	-.34	-

Note. EDE-Q = Eating Disorder Examination Questionnaire; EDI-BD = Eating Disorder Inventory -2- Body Dissatisfaction Scale; CSAW = Concerns for Shape and Weight Scale; BCQ = Body Checking Questionnaire; BIAQ = Body Image Avoidance Questionnaire; DRES = Dutch Restrained Eating Scale; RSE = Rosenberg Self-Esteem Scale; K6 = Kessler 6-Item Psychological Distress Scale; PANAS = Positive and Negative Affect Schedule. Correlations above the diagonal are for the population ($N = 577$) and below the diagonal are for the intervention group sample ($n = 60$).

*p >.05.

Appendix R

Completer Analysis

Efficacy Analysis of Primary Outcomes Among Completers

A one-between (group), one-within (time) MANOVA was conducted on the seven primary outcome measures of body image. Only those who completed the post-intervention questionnaire (MPE: $n = 26$, TP2: $n = 26$) were in included in the analysis. A significant multivariate time main effect was observed, Wilks' $\Lambda = .56$, $F(7, 44) = 4.86$, $p = .001$, $\eta^2 = .43$. Neither the intervention group main effect [Wilks' $\Lambda = .94$, $F(7,44) = 0.38$, $p = .907$, $\eta^2 = .06$] nor the Time X Group interaction proved to be statistically significant, Wilks' $\Lambda = .87$, $F(7, 44) = 0.92$, $p = .50$, $\eta^2 = .13$.

Follow-up univariate one-within (time) ANOVAs were conducted separately for each of the seven primary outcome measures of body image. Corresponding Levene's test for homogeneity of variance were nonsignificant for each of the measures. To maintain the family-wise type I α at .05, the per-comparison error rate was Bonferroni adjusted as follows, .05/7 tests =.007. All individual time effects were statistically significant (see Table R1). These findings indicate that participants reported improvements in their body image regardless of the intervention they received.

Efficacy Analysis of Secondary Outcomes Among completers

A one-between (group), one-within (time) MANOVA was conducted on the seven secondary outcome measures. Only those who completed the post-intervention questionnaire (MPE, $n = 26$; TP2 $n = 26$) were included in the analysis. A significant multivariate time main effect was observed, Wilks' $\Lambda = .54$, $F(7, 44) = 5.33$, $p = .001$, $\eta_p^2 = .45$. Neither the intervention group main effect [Wilks' $\Lambda = .86$; $F(7,44) = 1.07$, $p = .40$, $\eta_p^2 = .15$] nor the Time X Group interaction proved to be statistically significant, Wilks' $\Lambda = .81$; $F(7, 44) = 1.48$, $p = .20$, $\eta_p^2 = .19$.

Table R1

Univariate Tests of Time Main Effect for the Primary Outcome Measures of Body Image with Completers

Measure	Baseline		Postintervention				
	M	*SD*	*M*	*SD*	*F*	*p*	η_p^2
CSAW - Affective	39.37	21.28	33.00	17.58	12.75	.001	.203
CSAW – Attitude	38.81	18.44	31.25	15.41	15.15	<.001	.233
EDI-2-BD	10.23	7.51	8.27	6.34	9.46	.003	.159
BCQ	55.92	19.60	50.83	17.15	12.07	.001	.194
BIAQ	32.27	13.85	29.27	14.29	10.79	.002	.177
EDE-Q-SC	2.87	1.83	2.23	1.75	20.21	<.001	.288
EDE-Q-WC	2.38	1.91	1.95	1.65	8.83	.005	.150

Note. CSAW = Concerns for Shape and Weight Scale; EDI-2-BD = Eating Disorder Inventory-2 Body Dissatisfaction Scale; BCQ = Body Checking Questionnaire; BIAQ = Body Image Avoidance Questionnaire; EDE-Q-SC = Eating Disorder Examination Questionnaire Shape Concern; EDE-Q-WC = Eating Disorder Examination Questionnaire Weight Concern. All tests are statistically significant at the Bonferroni adjusted per-comparison type I error-rate = .007. Time effect $df = 1$, error $df = 58$.

Follow-up univariate one-within (time) ANOVAs were conducted separately for each of the seven secondary outcome measures. Levene's test for homogeneity of variance were nonsignificant for six of the secondary variables. As variance between the two groups did significantly differ on the EDEQ-R at baseline ($p = .04$), and PANAS-NA at post-intervention ($p = .01$), natural logarithmic transformations were performed on these scores (Tabachnick & Fidell, 2007). To maintain the family-wise type I α at .05, the per-comparison error rate was Bonferroni adjusted as follows, .05/7 tests =.007. Univariate ANOVAs on the EDE-Q-EC, DRES, and RSE were significant for time. Univariate ANOVAs on the EDE-Q-R, PANAS- PA, PANAS- NA, and K6 were nonsignificant over time (see Table R2). In summary, participants reported improvements on two of three dieting behaviour measures and in self-esteem regardless of the intervention they received.

Table R2

Univariate Tests of Time Main Effect for the Secondary Outcome Measures of Body Image with Completers

Measure	Baseline		Postintervention				
	M	*SD*	*M*	*SD*	*F*	*p*	η_p^2
EDE-Q-EC	1.60	1.63	1.16	1.43	13.02	.001	.258
EDE-Q-R	1.81	1.76	1.50	1.72	7.10 [a]	.010	.124
DRES	2.79	1.12	2.49	1.18	23.47	<.001	.207
RSE	28.90	5.64	30.74	5.29	17.37	<.001	.319
PANAS-PA	31.55	6.89	33.40	7.58	2.95	.092	.056
PANAS-NA	23.46	7.49	21.49	7.68	7.28 [a]	.009	.127
K6	7.56	3.82	6.62	4.31	5.53	.023	.099

Note. EDE-Q-EC = Eating Disorder Examination Questionnaire Eating Concern; EDE-Q-EC = Eating Disorder Examination Questionnaire Restraint; DRES = Dutch Restrained Eating Scale; RSE = Rosenberg Self-Esteem Scale; PHLMS = Philadelphia Mindfulness Scale; PANAS = Positive and Negative Affect Schedule; K6 = Kessler 6-Item Psychological Distress Scale.

[a] *F*, *p*, and η_p^2 for EDE-Q-R and PANAS-NA reflect values that were transformed through the natural log of the raw scores, while *M* and *SD* reflect the descriptive statistics of the untransformed values.

* significant based on Bonferroni's post hoc mean comparison test significance value of .007. Time *df* = 1, Error *df* = 44.

Appendix S

Research Ethics Board Approval

Lakehead
UNIVERSITY

Office of Research

Tel (807) 343-8283
Fax (807) 346-7749

February 13, 2007

Amanda McMahan
Department of Psychology
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1

Dear Ms. McMahan:

Re: REB Project #: 051 06-07
Granting Agency name: N/A
Granting Agency Project #: N/A

On the recommendation of the Research Ethics Board, I am pleased to grant ethical approval to your research project entitled, "A Randomized, Control Trial of Mindfulness Plus Exposure for Reducing Body Dissatisfaction in Women".

Ethics approval is valid until **February 13, 2008**. Please submit a Request for Renewal form to the Office of Research by January 13, 2008 if your research involving human subjects will continue for longer than one year. A Final Report must be submitted promptly upon completion of the project. Research Ethics Board forms are available at:

http://bolt.lakeheadu.ca/~researchwww/internalforms.html

During the course of the study, any modifications to the protocol or forms must not be initiated without prior written approval from the REB. You must promptly notify the REB of any adverse events that may occur.

Completed reports and correspondence may be directed to:

Research Ethics Board
c/o Office of Research
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1
Fax: (807) 346-7749

Best wishes for a successful research project.

Sincerely,

Dr. Richard Maundrell
Chair, Research Ethics Board

/len

cc: Dr. Ron Davis, Psychology
Faculty of Graduate Studies
Office of Research